Safety Light Curtain

F3SG-R Series

New standard, offering both robustness and reliability

EMITTER
RECEIVER
TOP
NPN
SLOW
SEQ
BLANK
omron

» Compact: Easy installation

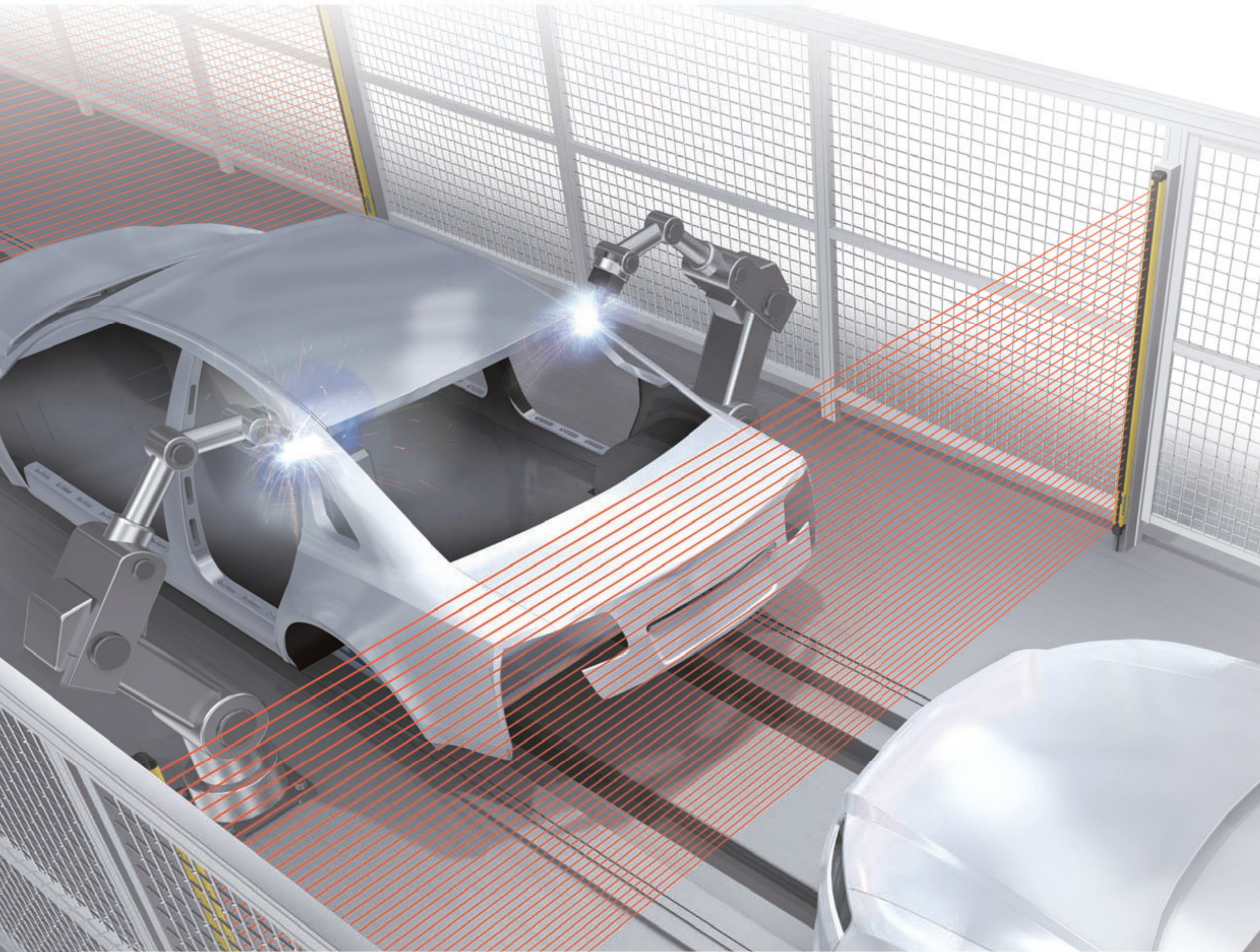
» Robust: Even in severe environments

» Global: Reliable safety solutions

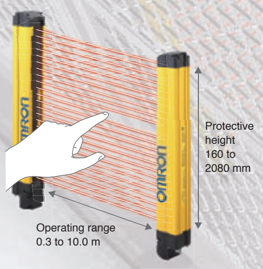
realizing

SAFETY,
TECHNOLOGY
& INNOVATION

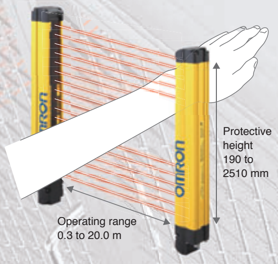
Next generation safety



Advance Advance type suitable for flexible production line applications

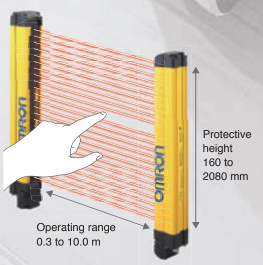

Protective height 160 to 2080 mm
Operating range 0.3 to 10.0 m
OMRON

F3SG-4RA□□□□-14
Detection capability: Dia. 14 mm

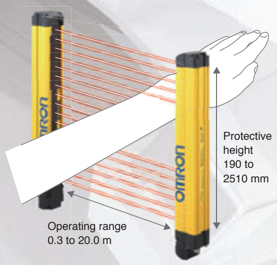

Protective height 190 to 2510 mm
Operating range 0.3 to 20.0 m
OMRON

F3SG-4RA□□□□-30
Detection capability: Dia. 30 mm

Easy **NEW** Easy type ideal for simple On/Off detection applications


Protective height 160 to 2080 mm
Operating range 0.3 to 10.0 m
OMRON

F3SG-4RE□□□□-14
Detection capability: Dia. 14 mm


Protective height 190 to 2510 mm
Operating range 0.3 to 20.0 m
OMRON

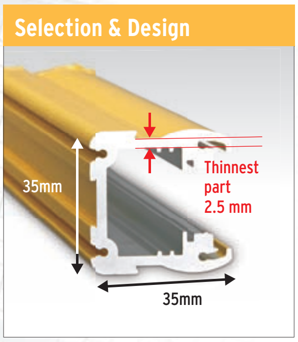
F3SG-4RE□□□□-30
Detection capability: Dia. 30 mm

light curtain packed with powerful features, offering both robustness and reliability

F3SG-R Benefit

Previously it took time to select the right safety light curtains for the conditions: physical conditions such as size and operating range, ambient environments, and countries.
If just one single safety light curtain can be used in a variety of environments, the time required for selection, installation, and maintenance can be reduced.

Selection & Design

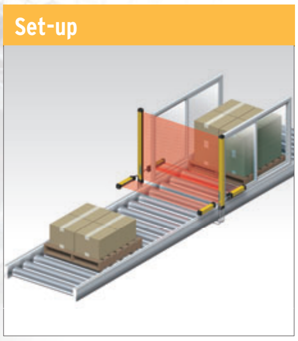


≫ p4

Easy Selection & Design

- **In almost any environment**
  Waterproof and shock-resistant yet compact body. Conforms to major international standards including Chinese standard GB 4585 to be used worldwide.
- **Ensuring safety in various production lines**
  The Muting function to automatically set a minimum muting zone according to workpiece height.
  Can be used for a variety of production lines.
- **Complete safety measures by detecting presence**
  Distinguishes between small object passing and human entry by changing resolution and response time.
  This maintains a high level of safety while minimizing unexpected machine downtime.

Set-up



≫ p8

Easy Set-up

- **Drastically reduced set-up time and wiring**
  The Smartclick connectors and optical synchronization enable smooth set-up of machines.
- **Simple, two-step optical adjustment**
  Quick adjustment by checking beam alignment with the LED indicators and Configuration Tool SD Manager2.
- **Flexible installation**
  More flexible layout by eliminating the need of synchronization wiring and using extension cables.

Operation

≫ p10

Stable Operation

- **Quick troubleshooting and predictive maintenance**
  The sticker and error logs stored in the F3SG-R helps speed troubleshooting. Accumulated log data facilitates systematic maintenance.
- **Mutual interference prevention**
  The DIP switches is used to change emission light intensity to prevent mutual interference with other sensors.

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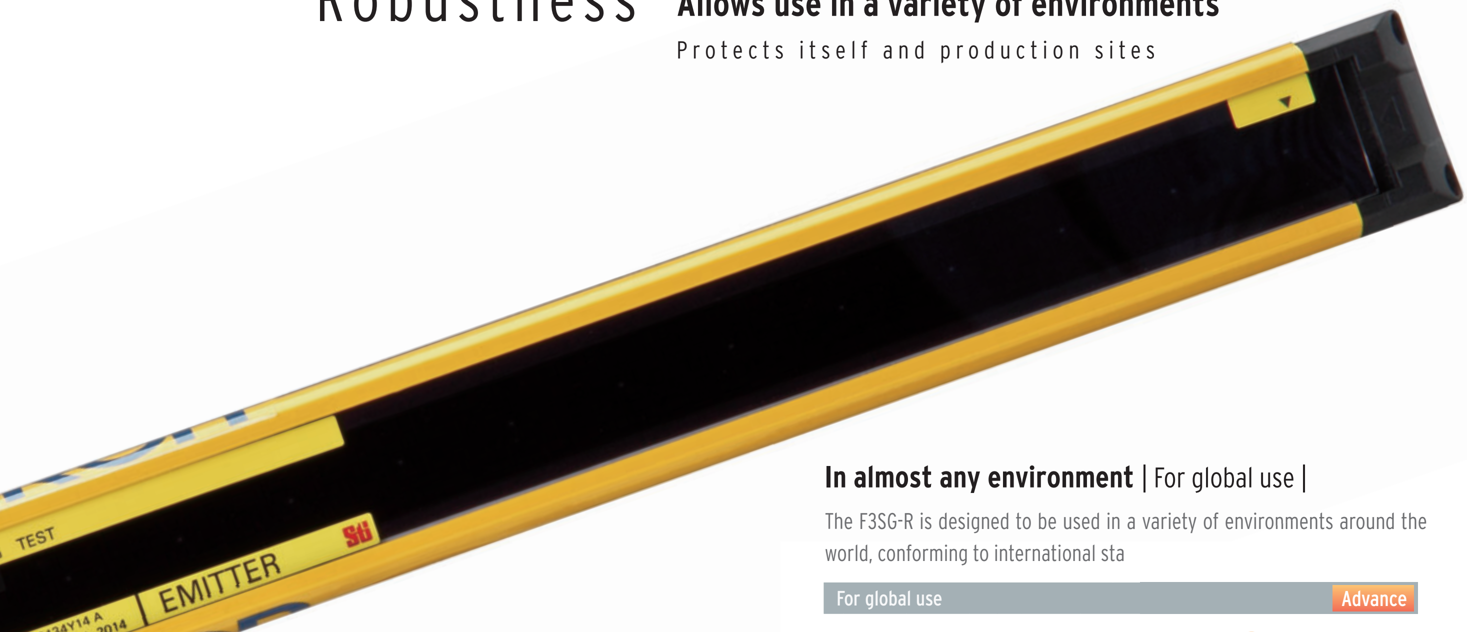
Robustness

Allows use in a variety of environments

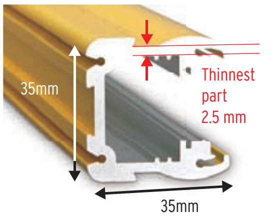
Protects itself and production sites


TEST
EMITTER
No.: L0134Y14 A
on: 1.0 Year: 2014

Robust and Compact | Robust housing | Advance Easy

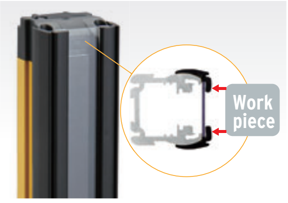
All models are equipped with a robust housing that can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.

Slim housing


35mm
Thinnest part 2.5 mm
35mm

The housing structure is significantly improved to enhance resistance against shock and vibration and to reduce the thickness of the thinnest part of the housing material from 3 mm to 2.5mm.

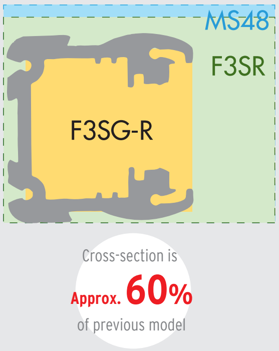
Protected with protection cover



The optical surface can be protected from contact with workpieces by using the optional protection cover together.

Downsized

The robust housing can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.


MS48
F3SR
F3SG-R
Cross-section is
Approx. 60%
of previous model

In almost any environment | For global use |

The F3SG-R is designed to be used in a variety of environments around the world, conforming to international sta

For global use Advance

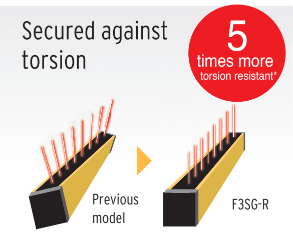
NPN
Global
PNP

PNP or NPN can be selected with the DIP switch. The same cables are used.

GB
International Standard
IEC
ISO

The F3SG-R conforms to major international standards including Chinese GB standards

For harsh environments Advance Easy


Secured against torsion
5 times more torsion resistant*
Previous model
F3SG-R

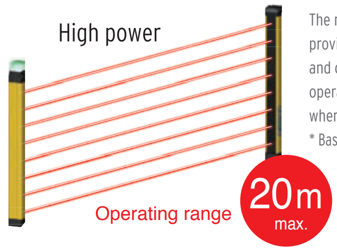
The risk of optical axis misalignment due to vibration or aging can be reduced.

IP67
RECEIVER

IP67 protection allows use in environments that are subject to water.

* Compared to OMRON previous model in December 2014.

Reliable even in harsh environments Advance Easy

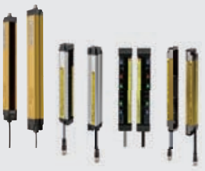

High power
Operating range
20m max.

The newly designed high-power optical system provides the best-in-class* light transmission and operating range. This allows stable operation even in dusty or other environments where light transmission is reduced.

* Based on OMRON investigation in December 2014.

Previously... Mixing several models

Several types of safety light curtains with different environmental resistance and functionality were required to suit the installation environment. It took time to select the right models.



New Muting Functionality

Increases both productivity and safety

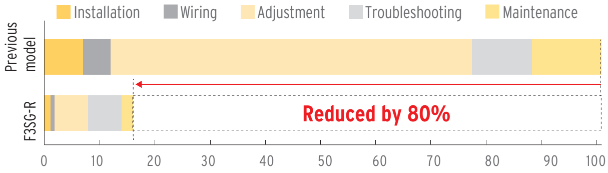
Easily distinguishes between workers and objects

Adjustment time reduced by 80%*

| Smart muting actuator | **Advance**

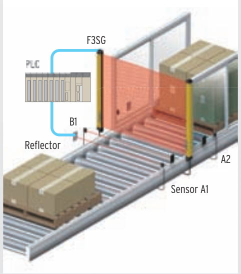
The use of the dedicated actuator can significantly reduce the time required to adjust the sensor to detect workpieces even in unstable conveying conditions

*Compared to the previous model (Based on OMRON investigation in September 2014)



Previously... **Many processes including programming and adjustment were required**

Since bypass processing to disable the safety light curtain was performed via the PLC, programming before installation required time and work. It also took a lot of time and work to install and adjust many muting sensors (sensors and reflectors).

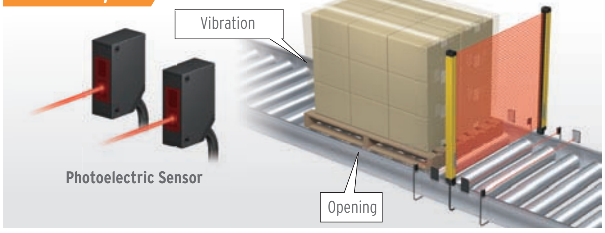

F3SG
PLC
B1
Reflector
A2
Sensor A1

Increasing both productivity and safety

| Muting function | **Advance**

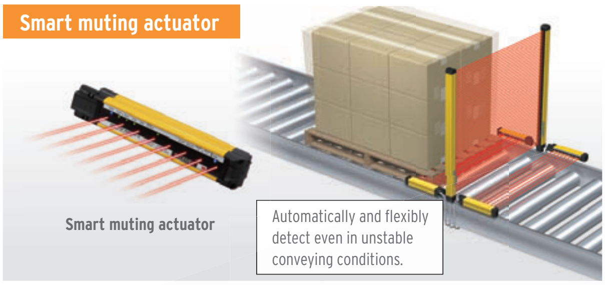
The F3SG-R provides advanced Muting function that detects the zone where workpieces pass or the position of a machine or robot and disable beams of the detected part. This increases both safety and productivity.
By adding the smart muting actuator, the F3SG-R provides stable operation even for the production lines where errors occur due to vibration caused by the passing workpiece.

Previously...


Vibration
Photoelectric Sensor
Opening

The point detection muting sensor mistakenly disabled muting while a workpiece was passing, which led to unexpected machine stops.

Smart muting actuator


Smart muting actuator
Automatically and flexibly detect even in unstable conveying conditions.

The muting actuator detects the surface of a passing workpiece. Even if a workpiece moves due to vibration, muting is kept enabled until the workpiece has passed. This prevents unexpected machine stops.

RECEIVER
NPN SLOW SEQ BLANK
TOP

Powerful Features

Prevent unexpected machine stops

Ensure stable operation

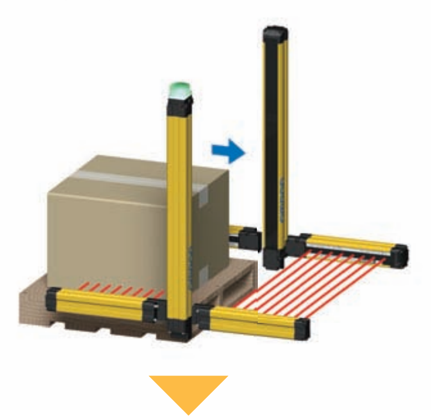
Auto-configuration of muting zone

| Dynamic Muting | **Advance**

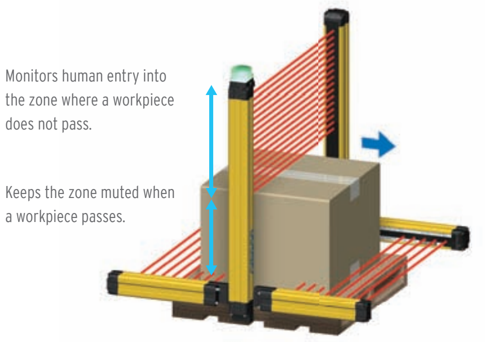
When workpieces with various heights are conveyed on the same line, partial muting is automatically performed based on the height of the workpiece. This advanced muting function can automatically perform normal detection at the zone where a workpiece does not pass.

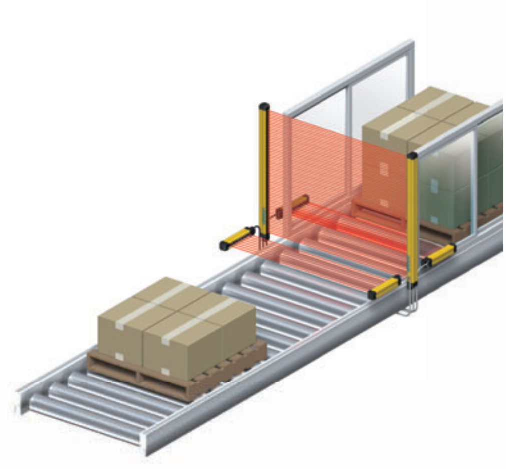
Automatically minimizes muting zone according to workpiece size

1 When the muting sensor detects that a workpiece passes, all beams are muted.



2 The only beams interrupted by the workpiece are kept muted and other beams are released from the muting state three seconds after the workpiece pass through the safety light curtain. Muting is disabled after the workpiece has passed.

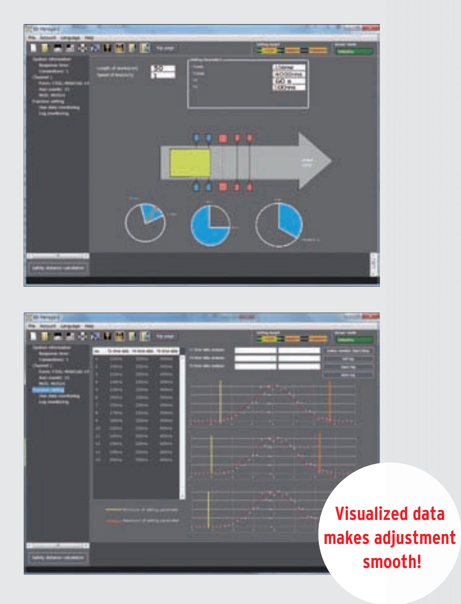

Monitors human entry into the zone where a workpiece does not pass.
Keeps the zone muted when a workpiece passes.



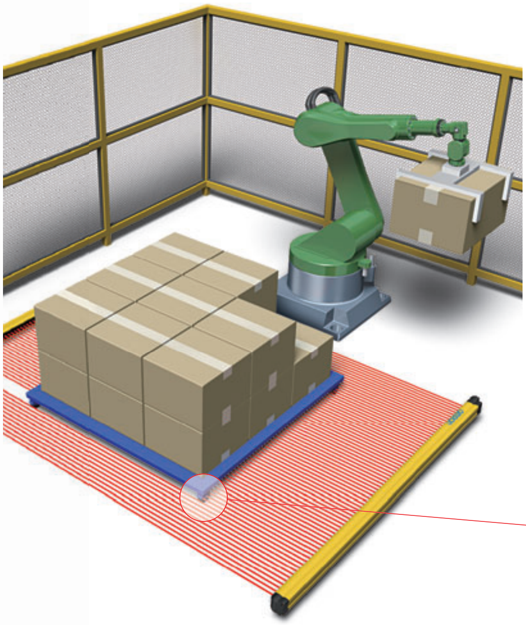
Minimizing setting and detection errors

| Configuration Tool SD Manager2 | **Advance**

The function to log the muting sensor operating conditions of the F3SG-R visualizes the installation position and setting conditions of the sensor to achieve reliable configuration. The stop due to the muting error can be analyzed using the data stored in the F3SG-R. Quick identification of the cause can reduce unexpected machine downtime.


Visualized data makes adjustment smooth!

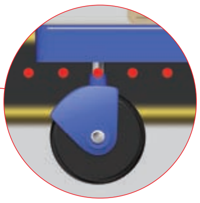
EIVER
SEQ SLOW NPN
TOP



Detecting both objects and workers

| Reduced Resolution | Advance

With the Reduced Resolution function that is used to change the number of interrupted beams (1 to 3 beams), the F3SG-R can detect human entry while workability is maintained. This makes easier to distinguish between objects and workers.



- Keep the safety outputs ON even when an object like a transport vehicle (with the size of 1 to 3 beams) is present discontinuously.
- Turn safety outputs OFF when an object with the size over 3 beams, like an ankle,

Preventing accidental stops due to insects

| Response Time Adjustment | Advance

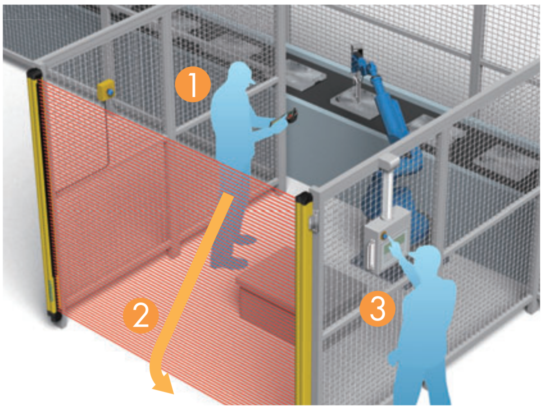
This function is used to distinguish between an instant passing of a small object such as an insect and a human passing by changing the time to respond to the block of the beam. Accidental machine stops can be avoided.

Ensuring safe restart

| Pre-reset | Advance

The Pre-reset function prevents possible accidents and supports safe restart of machines. Even if an worker press the reset switch of the safety light curtain without noticing another worker near the robot, restart will not be executed unless certain conditions are met.

Helps prevent workers from being trapped



1 Press the pre-reset switch in the hazardous zone (safety fence)

▼

2 Get out of the hazardous zone (safety fence)

▼

3 Press the reset switch in the control panel to restart the F3SG-R. The machine is ready for restart.

The machine cannot be restarted until the pre-reset switch is pressed to restart the F3SG-R.

Smart Wiring, Beam Adjustment, and Operation Check

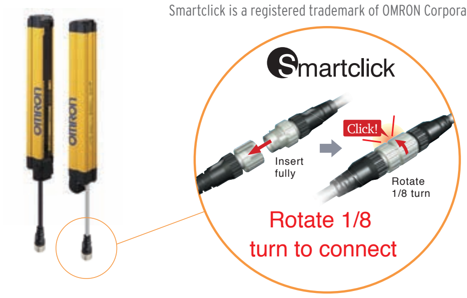
Facilitate installation

No torque control required | Smartclick | Advance Easy

Smartclick connectors are used to quickly connect cables. Just turn the round waterproof M12 connector 1/8 of a turn. This stress-free connection reduces time required for wiring and replacement when many devices are connected together.

Smartclick

Smartclick is a registered trademark of OMRON Corporation.



This popular connector is used for a variety of OMRON products to reduce time required for wiring and replacement when many devices are connected together.

Previously... **Faulty connection and need of torque control**

When many safety light curtains were connected, torque control of connectors was required and delay in set-up occurred due to failure of connection. The Smartclick connector can be connected with the existing screw-type M12 connector.

Long-distance wiring
| Maximum 100 m cable length | Advance Easy

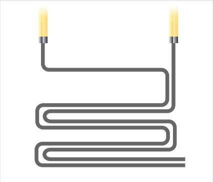
The total extension cable length is up to 100 m. Flexible wiring maximizes long-distance detection and optical synchronization functionality.

Simple wiring
| Simple wiring connector | Advance Easy

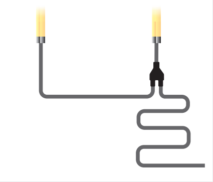
Simple wiring connector can reduce wiring time. Fewer cables mean that the risk of disconnection and noise troubles can also be reduced.

Previously...

Cables of the emitter and receiver



Only one cable



No limitation in wiring
| Optical synchronization | Advance Easy

Optical synchronization eliminates the need of synchronization wiring between the emitter and receiver. Flexible wiring enables reducing disconnection risk and avoiding noise sources.

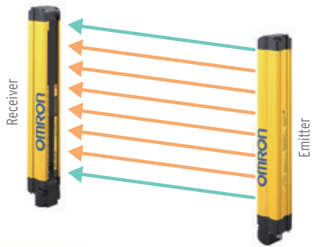
Flexible, new method

High ambient light immunity

Fine tuning all beams, the F3SG-R provides high ambient light immunity and flexible detection functions.

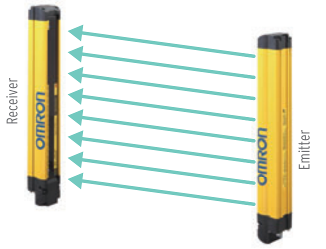
Start-up

The Top or Bottom beam of the emitter starts synchronizing with the corresponding beam of the receiver.



After sync

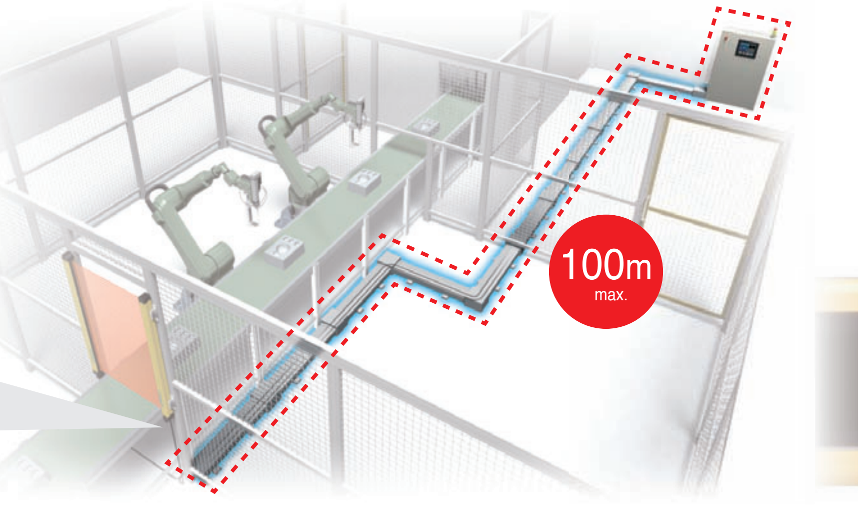
Once synchronization is done, the emitter is kept synchronized with the receiver while at least one beam is unblocked.



Previously... **Limitations imposed by synchronization wiring**

Wiring and connection works between the emitter and receiver were required.

- With the previous synchronization function, if the Top or Bottom beam was blocked, synchronization was not maintained.



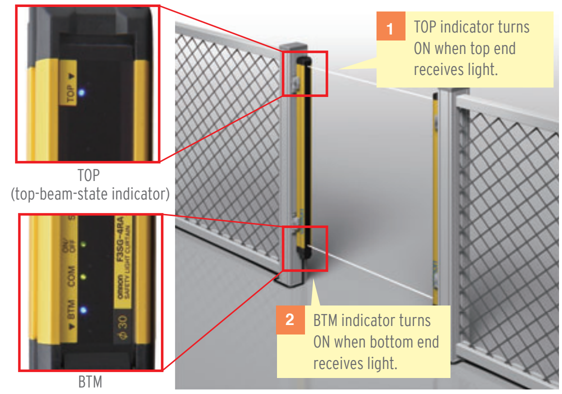
RECEIVER
TOP
NPN SLOW SEQ BLANK

Simple two steps | Beam adjustment | Advance

The benefit of robust, torsion-resistant housing contributes to reduce the time required to install the safety light curtain.

Simple adjustment: Coarse adjustment → positional alignment

Beam adjustment can be done easily by checking the TOP and BTM LED indicators. The SD Manager 2 helps install the safety light curtain by showing the incident light levels of each beam.


TOP
BTM
COM
ON
OFF
F3SG-4RA
omron SAFETY LIGHT CURTAIN
30

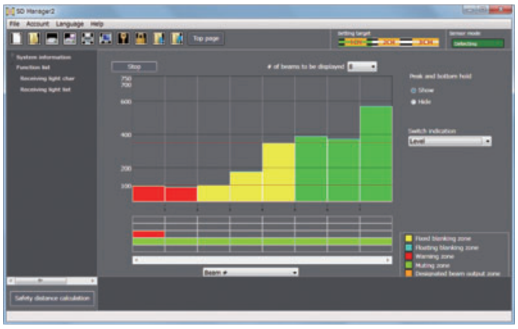
1 TOP indicator turns ON when top end receives light.

2 BTM indicator turns ON when bottom end receives light.

TOP
(top-beam-state indicator)

BTM
(bottom-beam-state indicator)

1 Adjustment is completed when the TOP, BTM, and STB LED indicators turn ON.


SD Manager2
File
Account
Language
Help
Top page
Setting target
Sensor mode
Detecting
System information
Function list
Receiving light chart
Receiving light list
Stop
# of beams to be displayed
750
700
600
400
200
100
Peak and bottom hold
Show
Hide
Switch indication
Level
Beam #
Fixed blanking zone
Floating blanking zone
Warning zone
Muting zone
Designated beam output zone
Safety distance calculation

2 Finer adjustments can be made using the Configuration Tool SB Manager2.

Easy adjustment after mounting

| Mounting bracket | Advance Easy

Two types of mounting brackets are available.

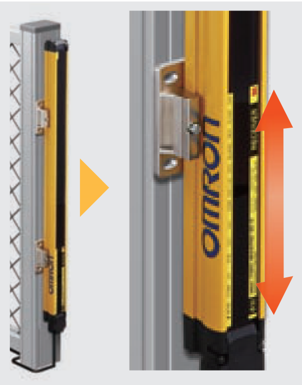
Standard fixed bracket

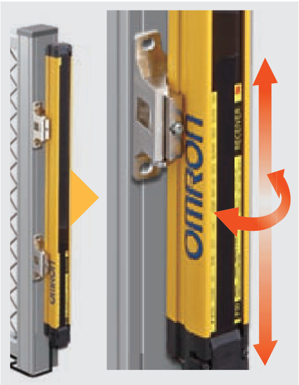
After mounted on a safety fence, the F3SG-R can be slid vertically to adjust. This means this mounting bracket allows for a wider adjustment range than the existing top/bottom mounting bracket.

Standard adjustable bracket

(sold separately)

In addition to vertical adjustment, the angle can be adjusted up to ±15°.adjusted up to ±15°.





Standard fixed bracket
The bracket is included in the F3SG-R.

Protective height	No. of brackets included
Less than 1,280 mm	2 sets
1,280 to 2,270 mm	3 sets
2,350 mm or more	4 sets

Quick
Troubleshooting and Predictive Maintenance

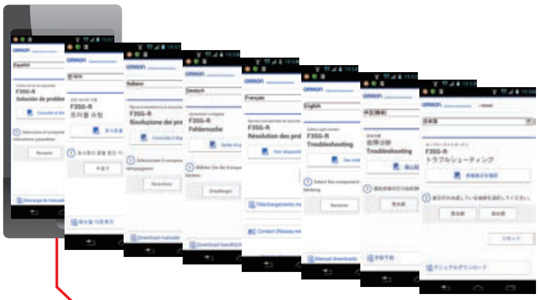
Eliminate machine downtime to ensure stable operation

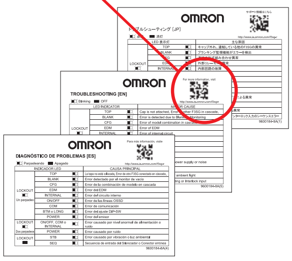
For global operators

| Multilingual troubleshooting | Advance Easy

Troubleshooting in eight languages is published on the website to find causes and solutions of errors that occur during operation. Operators across the world can check the error details in their local languages, which will help them minimize time to troubleshoot.

Troubleshooting Web





Troubleshooting guide sticker

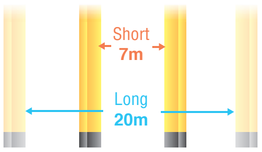
* English, Chinese, Italian, Korean, French, German, Spanish, and Japanese

Reducing stops due to mutual interference

| Operating Range Selection | Advance Easy

When other sensors are installed near the F3SG-R, Operating Range Selection helps reduce mutual interference.

Operating range



Mutual interference with the other sensor near the F3SG-R can be reduced by changing the mode from Long * to Short (7 m).

*. Maximum operating range of 20 m for hand/arm protection or 10 m for finger protection

The mode of Operating Range Selection can be selected with the DIP Switches* on the emitter.

*. For the F3SG-RE, the mode can be selected by wiring.

* The Interface Unit F39-GIF is required to connect with a personal computer.

Quick troubleshooting | Data logging 1 | Advance

The error logs stored in the F3SG-R can be obtained by connecting with a personal computer via the interface unit. The Configuration Tool SD Manager2 analyzes error logs to identify causes of errors and suggest solutions. This helps simplify troubleshooting.

Systematic maintenance based on trend management

| Data logging 2 | Advance

By using the Configuration Tool SD Manager2, the data of light intensity, power-ON time, and switching frequency of the F3SG-R can be collected regularly to predict when systematic and preventive maintenance is required.

NEW Easy type

Easy-to-use safety sensor

Ideal for Simple On/Off Detection Applications

Robust but slim housing and basic safety functions are inherited from the F3SG-R Advance type. Providing only simple safety functions, the Easy type helps save TCO (Total Cost of Ownership) by reducing errors that required a lot of time to identify the causes.

Simple wiring

Only four wires are required for the minimum configuration, which is as simple as wiring a photoelectric sensor. Simple connection with a safety controller makes it easy to build a safety circuit. Commercially available M12 connector cables can be used for extension cables.

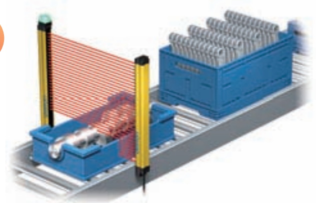
Fast response time of 5 ms

The Easy type that allows the distance between the light curtain and hazard source to be reduced is best suited to use in a small machine.

F3SG-R Line-up

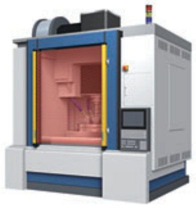
Advance type F3SG-RA

For flexible production lines



Easy type F3SG-RE

For small machines



List of Feature

Feature	Advance type	Easy type	Factory default setting (Advance type)
	F3SG-RA	F3SG-RE	
PNP/NPN Selection	▬		PNP output
External Test	▬		24 V Active
Interlock	▬ 💻		Auto Reset Mode
Pre-Reset	▬ 💻		Disabled
External Device Monitoring(EDM)	▬ 💻		Disabled
Auxiliary Output	💻		Muting /Override information
Muting	💻		Standard Muting mode
Override	💻		Enabled
Fixed Blanking	▬ 💻		Disabled
Floating Blanking	▬ 💻		Disabled
Reduced Resolution	💻		Disabled
Warning Zone	💻		Disabled
Scan Code Selection	▬		CodeA
Operating Range Selection	▬	●	Short mode
Response Time Adjustment	💻		Standard mode
Lamp	💻		Red:Disabled Orange:Disabled Green:Muting/Override information
Designated Beam Output	💻		Disabled
Cascade Connection	●		

▬ Setting by DIP Switch 💻 Setting by Configuration Tool ● Setting by Wiring

Safety Sensor Line-up

More slim models

Safety Light Curtain F3SJ

Cat. No. F074

For flexible zone detection

Safety Laser Scanner

Cat. No. Z298

Safety Light Curtain Advance type

F3SG-RA

New Standard of Safety Light Curtain,Offering Both Robustness and Reliability

- Robust and compact
- New muting function to increase both productivity and safety
- All models designed for global use. PNP/NPN selection by DIP switch
- Conforming to major international standards including Chinese standard GB 4584

Ordering Information

Main Units

Safety Light Curtain

Finger protection

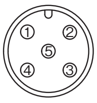
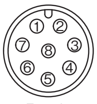
Number of beams	Protective height (mm)	Model
15	160	**F3SG-4RA0160-14**
23	240	**F3SG-4RA0240-14**
31	320	**F3SG-4RA0320-14**
39	400	**F3SG-4RA0400-14**
47	480	**F3SG-4RA0480-14**
55	560	**F3SG-4RA0560-14**
63	640	**F3SG-4RA0640-14**
71	720	**F3SG-4RA0720-14**
79	800	**F3SG-4RA0800-14**
87	880	**F3SG-4RA0880-14**
95	960	**F3SG-4RA0960-14**
103	1,040	**F3SG-4RA1040-14**
111	1,120	**F3SG-4RA1120-14**
119	1,200	**F3SG-4RA1200-14**
127	1,280	**F3SG-4RA1280-14**
135	1,360	**F3SG-4RA1360-14**
143	1,440	**F3SG-4RA1440-14**
151	1,520	**F3SG-4RA1520-14**
159	1,600	**F3SG-4RA1600-14**
167	1,680	**F3SG-4RA1680-14**
175	1,760	**F3SG-4RA1760-14**
183	1,840	**F3SG-4RA1840-14**
191	1,920	**F3SG-4RA1920-14**
199	2,000	**F3SG-4RA2000-14**
207	2,080	**F3SG-4RA2080-14**

Hand and arm protection

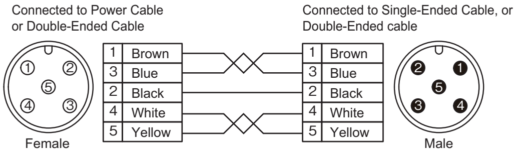
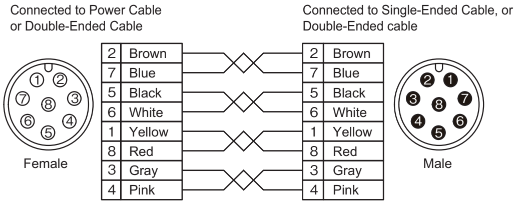
Number of beams	Protective height (mm)	Model
8	190	**F3SG-4RA0190-30**
12	270	**F3SG-4RA0270-30**
16	350	**F3SG-4RA0350-30**
20	430	**F3SG-4RA0430-30**
24	510	**F3SG-4RA0510-30**
28	590	**F3SG-4RA0590-30**
32	670	**F3SG-4RA0670-30**
36	750	**F3SG-4RA0750-30**
40	830	**F3SG-4RA0830-30**
44	910	**F3SG-4RA0910-30**
48	990	**F3SG-4RA0990-30**
52	1,070	**F3SG-4RA1070-30**
56	1,150	**F3SG-4RA1150-30**
60	1,230	**F3SG-4RA1230-30**
64	1,310	**F3SG-4RA1310-30**
68	1,390	**F3SG-4RA1390-30**
72	1,470	**F3SG-4RA1470-30**
76	1,550	**F3SG-4RA1550-30**
80	1,630	**F3SG-4RA1630-30**
84	1,710	**F3SG-4RA1710-30**
88	1,790	**F3SG-4RA1790-30**
92	1,870	**F3SG-4RA1870-30**
96	1,950	**F3SG-4RA1950-30**
100	2,030	**F3SG-4RA2030-30**
104	2,110	**F3SG-4RA2110-30**
108	2,190	**F3SG-4RA2190-30**
112	2,270	**F3SG-4RA2270-30**
116	2,350	**F3SG-4RA2350-30**
120	2,430	**F3SG-4RA2430-30**
124	2,510	**F3SG-4RA2510-30**

Accessories (Sold separately)

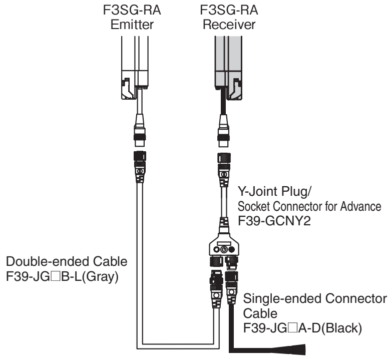
Single-ended Connector Cable

Appearance	Type	Cable length	Specifications	Model
	For emitter M12 connector (5-pin), 5 wires Color: Gray	3 m	 Female 1 +24 VDC Brown 2 TEST Black 3 0 VDC Blue 4 Not used White 5 Not used Yellow	F39-JG3A-L
		7 m		F39-JG7A-L
		10 m		F39-JG10A-L
		15 m		F39-JG15A-L
		20 m		F39-JG20A-L
	For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	 Female 1 RESET Yellow 2 +24 VDC Brown 3 MUTE A Gray 4 MUTE B Pink 5 OSSD 1 Black 6 OSSD 2 White 7 0 VDC Blue 8 AUX Red	F39-JG3A-D
		7 m		F39-JG7A-D
		10 m		F39-JG10A-D
		15 m		F39-JG15A-D
		20 m		F39-JG20A-D

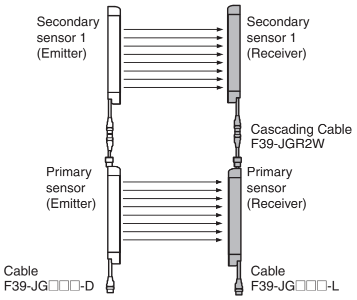
Double-ended Cable
For cable extension and simple wiring

Appearance	Type	Cable length	Specifications	Model
	For emitter M12 connector (5-pin) on both ends Color: Gray	0.5 m	 Connected to Power Cable or Double-Ended Cable Female 1 Brown 3 Blue 2 Black 4 White 5 Yellow Connected to Single-Ended Cable, or Double-Ended cable Male 1 Brown 3 Blue 2 Black 4 White 5 Yellow	F39-JGR5B-L
		1 m		F39-JG1B-L
		3 m		F39-JG3B-L
		5 m		F39-JG5B-L
		7 m		F39-JG7B-L
		10 m		F39-JG10B-L
		15 m		F39-JG15B-L
		20 m		F39-JG20B-L
	For receiver M12 connector (8-pin) on both ends Color: Black	0.5 m	 Connected to Power Cable or Double-Ended Cable Female 2 Brown 7 Blue 5 Black 6 White 1 Yellow 8 Red 3 Gray 4 Pink Connected to Single-Ended Cable, or Double-Ended cable Male 2 Brown 7 Blue 5 Black 6 White 1 Yellow 8 Red 3 Gray 4 Pink	F39-JGR5B-D
		1 m		F39-JG1B-D
		3 m		F39-JG3B-D
		5 m		F39-JG5B-D
		7 m		F39-JG7B-D
		10 m		F39-JG10B-D
		15 m		F39-JG15B-D
		20 m		F39-JG20B-D

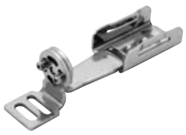
Y-Joint Plug/Socket Connector for Advance type F3SG-RA

Appearance	Type	Cable length	Specifications	Model
	M12 connectors. Used for reduced wiring.	0.5 m	 F3SG-RA Emitter F3SG-RA Receiver Y-Joint Plug/ Socket Connector for Advance F39-GCNY2 Double-ended Cable F39-JG□B-L(Gray) Single-ended Connector Cable F39-JG□A-D(Black)	F39-GCNY2

Cascading Cable (Two cables per set, for emitter and receiver)

Appearance	Type	Cable length	Specifications	Model
	Emitter cable: Cap (5-pin), M12 connector (5-pin) Receiver cable: Cap (8-pin), M12 connector (8-pin)	0.2 m	 Secondary sensor 1 (Emitter) Secondary sensor 1 (Receiver) Cascading Cable F39-JGR2W Primary sensor (Emitter) Primary sensor (Receiver) Cable F39-JG□□□-D Cable F39-JG□□□-L	F39-JGR2W

Sensor Mounting Brackets

Appearance	Specification	Application	Model
	Standard Fixed Bracket	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package. See *1 below for the number of included brackets.)	**F39-LGF**
	Standard Adjustable Bracket	Bracket to mount the F3SG-R. Beam alignment after mounting possible.The angle adjustment range is ±15°. Side mounting and backside mounting possible. (Sold separately. See *1 below for the number of required brackets.)	**F39-LGA**
	Top/Bottom Adjustable Bracket *2	Bracket to mount the F3SG-R. Use this bracket at the top and bottom positions of the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is ±22.5°. Side mounting and backside mounting possible. (Sold separately. 4 brackets per set.)	**F39-LGTB**
	Top/Bottom Adjustable Bracket *2 (For user-made mounting part)	Top/Bottom Adjustable Bracket without a bracket to mount to the wall. Use the user's own wall mounting part to suit the machine. (Sold separately. 4 brackets per set.)	**F39-LGTB-1**

*1 Two brackets per set
[for F3SG-□RA□□□□-14]
- Protective height of 0160 to 1200: 2 sets, Protective height of 1280 to 2080: 3 sets
[for F3SG-□RA□□□□-30]
- Protective height of 0190 to 1230: 2 sets, Protective height of 1310 to 2270: 3 sets, Protective height of 2350 to 2510: 4 sets

*2 Top/Bottom Adjustable Bracket cannot be used with the Standard Fixed Bracket. Use with the Standard Adjustable Bracket. (See *1 for the number of required brackets.)

Interface units and configuration tool SD Manager 2

Appearance	Type	Specifications	Model
	SD Manager2	The Configuration Tool SD Manager 2 is available to download from our website at http://www.ia.omron.com/f3sg-r_tool. To change the settings of the F3SG-RA using SD Manager 2, it is necessary to set the receiver's two DIP switches No. 8 to ON.	–
	Interface Unit	F39-GIF interface unit to connect the F3SG-RA receiver to a USB port of the PC	**F39-GIF**
	Bluetooth unit	F39-BT bluetooth unit to enable bluetooth on the F3SG-RA	**F39-BT**

Lamp

Appearance	Type	Specifications	Model
	Lamp unit	The lamp unit can be connected to a receiver and turned ON based on the operation of F3SG-RA. The lamp can indicate red, orange, and green colors, to which three different states can be assigned.	**F39-LP**
	Bluetooth + Lamp unit		**F39-BTLP**

End Cap

Appearance	Specifications	Model
	Housing color: Black For both emitter and receiver (Attached to the F3SG-R. The End Cap can be purchased if lost.)	**F39-CNM**

Laser Pointer for F3SG-R

Appearance	Specifications	Model
	The laser pointer is attached on the optical surface of the F3SG to help coarse adjustment of beams.	**F39-PTG**

Spatter Protection Cover(Two covers per set, for emitter and receiver)

Spatter Protection Covers include mounting brackets.
For Safety Light Curtain models of the protective height of 2,000 mm or longer, use two Spatter Protection Covers of different lengths.

Appearance	Safety Light Curtain Model		Model
	Finger protection	Hand and arm protection	
	F3SG-□RA0160-14	**F3SG-□RA0190-30**	**F39-HGA0200**
	F3SG-□RA0240-14	**F3SG-□RA0270-30**	**F39-HGA0280**
	F3SG-□RA0320-14	**F3SG-□RA0350-30**	**F39-HGA0360**
	F3SG-□RA0400-14	**F3SG-□RA0430-30**	**F39-HGA0440**
	F3SG-□RA0480-14	**F3SG-□RA0510-30**	**F39-HGA0520**
	F3SG-□RA0560-14	**F3SG-□RA0590-30**	**F39-HGA0600**
	F3SG-□RA0640-14	**F3SG-□RA0670-30**	**F39-HGA0680**
	F3SG-□RA0720-14	**F3SG-□RA0750-30**	**F39-HGA0760**
	F3SG-□RA0800-14	**F3SG-□RA0830-30**	**F39-HGA0840**
	F3SG-□RA0880-14	**F3SG-□RA0910-30**	**F39-HGA0920**
	F3SG-□RA0960-14	**F3SG-□RA0990-30**	**F39-HGA1000**
	F3SG-□RA1040-14	**F3SG-□RA1070-30**	**F39-HGA1080**
	F3SG-□RA1120-14	**F3SG-□RA1150-30**	**F39-HGA1160**
	F3SG-□RA1200-14	**F3SG-□RA1230-30**	**F39-HGA1240**
	F3SG-□RA1280-14	**F3SG-□RA1310-30**	**F39-HGA1320**
	F3SG-□RA1360-14	**F3SG-□RA1390-30**	**F39-HGA1400**
	F3SG-□RA1440-14	**F3SG-□RA1470-30**	**F39-HGA1480**
	F3SG-□RA1520-14	**F3SG-□RA1550-30**	**F39-HGA1560**
	F3SG-□RA1600-14	**F3SG-□RA1630-30**	**F39-HGA1640**
	F3SG-□RA1680-14	**F3SG-□RA1710-30**	**F39-HGA1720**
	F3SG-□RA1760-14	**F3SG-□RA1790-30**	**F39-HGA1800**
	F3SG-□RA1840-14	**F3SG-□RA1870-30**	**F39-HGA1880**
	F3SG-□RA1920-14	**F3SG-□RA1950-30**	**F39-HGA1960**
	F3SG-□RA2000-14	**F3SG-□RA2030-30**	**F39-HGA1480**
			F39-HGA0550
	F3SG-□RA2080-14	**F3SG-□RA2110-30**	**F39-HGA1560**
			F39-HGA0550
	–	**F3SG-□RA2190-30**	**F39-HGA1640**
			F39-HGA0550
	–	**F3SG-□RA2270-30**	**F39-HGA1720**
			F39-HGA0550
	–	**F3SG-□RA2350-30**	**F39-HGA1800**
			F39-HGA0550
	–	**F3SG-□RA2430-30**	**F39-HGA1880**
			F39-HGA0550
	–	**F3SG-□RA2510-30**	**F39-HGA1960**
			F39-HGA0550

Note: The operating range of the Safety Light Curtain attached with the product is 10% shorter than the rating.

Test Rod

Diameter	Model
14 mm dia.	**F39-TRD14**
30 mm dia.	**F39-TRD30**

F3SG-RA

Ratings and Specifications

Main unit

			F3SG-4RA□□□□-14 **F3SG-2RA□□□□-14**	**F3SG-4RA□□□□-30** **F3SG-2RA□□□□-30**
Type of ESPE (IEC 61496-1)		**Type 4**	F3SG-4RA□□□□-14/-30	
		Type 2	F3SG-2RA□□□□-14/-30	
Performance	**Object Resolution (Detection Capability)**		Opaque objects	
			14-mm dia.	30-mm dia.
	Beam Gap		10 mm	20 mm
	Number of Beams		15 to 207	8 to 124
	Lens Size		5.2 × 3.4 (W × H) mm	7-mm dia.
	Protective Height		160 to 2080 mm (6.3 to 81.9 inch)	190 to 2510 mm (7.3 to 98.7 inch)
	Operating Range	**Long**	0.3 to 10.0 m (1 to 32 ft.)	0.3 to 20.0 m (1 to 65 ft.)
		Short	0.3 to 3.0 m (1 to 10 ft.)	0.3 to 7.0 m (1 to 23 ft.)
	Response Time	**ON to OFF**	Normal mode: 8 to 18 ms max. *1 Slow mode: 16 to 36 ms max. *1 *2	
		OFF to ON	40 to 90 ms max. *1	
		*1 Response time when used in one segment system or in cascaded connection. 📖 Refer to page 18. *2 Selectable by Configuration Tool.		
	Effective Aperture Angle (EAA) (IEC 61496-2)	**Type 4**	±2.5° max., emitter and receiver at operating range of 3 m or greater	
		Type 2	±5.0° max., emitter and receiver at operating range of 3 m or greater	
	Light Source		Infrared LEDs, Wavelength: 870 nm	
	Startup Waiting Time		2 s max.	
Electrical	**Power Supply Voltage (Vs)**		SELV/PELV 24 VDC±20% (ripple p-p 10% max.)	
	Current Consumption		📖 Refer to page18 .	
	Safety Outputs (OSSD)		Two PNP or NPN transistor outputs (PNP or NPN is selectable by DIP Switch.) Load current of 300 mA max., Residual voltage of 2 V max. (except for voltage drop due to cable extension), Capacitive load of 1 μF max., Inductive load of 2.2 H max. *1 Leakage current of 1 mA max. (PNP), 2 mA max. (NPN) *2 *1 The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger. *2 These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor.	
	Auxiliary Output		One PNP or NPN transistor output (PNP or NPN is selectable by DIP Switch.) Load current of 100 mA max., Residual voltage of 2 V max .	
	Output Operation Mode	**Safety Output**	Light-ON (Safety output is enabled when the receiver receives an emitting signal.)	
		Auxiliary Output	Muting or Override output (default) (Configurable by Configuration Tool)	
	Input Voltage	**ON Voltage**	TEST: 24 V Active: 9 V to Vs (sink current 3 mA max.) * 0 V Active: 0 to 3 V (source current 3 mA max.) MUTE A/B: PNP: Vs to Vs-3 V (sink current 3 mA max.) * NPN: 0 to 3 V (source current 3 mA max.) RESET: PNP: Vs to Vs-3 V (sink current 5 mA max.) * NPN: 0 to 3 V (source current 5 mA max.)	
		OFF Voltage	TEST: 24 V Active : 0 to 1.5 V or open 0 V Active : 9 V to Vs or open MUTE A/B, RESET: PNP: 0 to 1/2 Vs, or open * NPN: 1/2 Vs to Vs, or open *	
		* The Vs indicates a supply voltage value in your environment.		
	Overvoltage Category (IEC 60664-1)		II	
	Indicators		📖 Refer to page 20.	
	Protective Circuit		Output short protection, Power supply reverse polarity protection	
	Insulation Resistance		20 MΩ or higher (500 VDC megger)	
	Dielectric Strength		1,000 VAC, 50/60 Hz (1 min)	
Functional	**Mutual Interference Prevention (Scan Code)**		This function prevents mutual interference in up to two F3SG-RA systems.	
	Cascade Connection		Number of cascaded segments: 3 max. Total number of beams: 255 max. Cable lengths between sensors: 10 m max.	
	Test Function		Self-test (at power-on, and during operation) External test (light emission stop function by test input)	
	Safety-Related Functions		Interlock External device monitoring (EDM) Pre-reset Fixed blanking/Floating blanking Reduced resolution Muting/Override Scan code selection PNP/NPN selection Response time adjustment	

			F3SG-4RA□□□□-14 F3SG-2RA□□□□-14	F3SG-4RA□□□□-30 F3SG-2RA□□□□-30
Environ-mental	**Ambient Temperature**	**Operating**	-10 to 55°C (14 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	**Operating**	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance		Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of Protection (IEC 60529)		IP65 and IP67	
	Vibration Resistance (IEC 61496-1)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
	Shock Resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes	
	Pollution Degree (IEC 60664-1)		Pollution Degree 3	
Connec-tions	**Power cable**	**Type of Connection**	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated, Cables prewired to the sensors	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	0.3 m	
		Cable Diameter	6 mm	
		Minimum Bending Radius	R5 mm	
	Cascading cable	**Type of Connection**	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	0.2 m	
		Cable Diameter	6 mm	
		Minimum Bending Radius	R5 mm	
	Extension cable **- Single-ended cable** **- Double-ended cable**	**Type of Connection**	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	📖 Refer to page 13.	
		Cable Diameter	6.6 mm	
		Minimum Bending Radius	R36 mm	
	Extension of Power Cable		100 m max.	
Material	**Material**		Housing: Aluminum Cap: PBT Front window: PMMA Cable: Oil resistant PVC Mounting Bracket: ZDC2 FE plate: SUS	
	Weight (packaged)		📖 Refer to page18 .	
	Included Accessories		Safety Precautions, Quick Installation Manual, Standard Fixed Bracket*, Troubleshooting Guide Sticker, Warning Zone Label * The quantity of Standard Fixed Brackets included varies depending on the protective height. [F3SG-□RA□□□□-14] - Protective height of 0160 to 1200: 2 sets - Protective height of 1280 to 2080: 3 sets [F3SG-□RA□□□□-30] - Protective height of 0190 to 1230: 2 sets - Protective height of 1310 to 2270: 3 sets - Protective height of 2350 to 2510: 4 sets	
Conformity	**Conforming standards**		📖 Refer to page 19.	
	Type of ESPE (IEC 61496-1)		Type 4	
	Performance Level (PL)/Safety category	**Type 4**	PL e/Category 4 (EN ISO 13849-1:2008)	
		Type 2	PL c/Category 2 (EN ISO 13849-1:2008)	
	PFHd		1.1 × 10^{-8} (IEC 61508)	
	Proof test interval T$_M$		Every 20 years (IEC 61508)	
	SFF		99% (IEC 61508)	
	HFT		1 (IEC 61508)	
	Classification		Type B (IEC 61508-2)	

Bluetooth Communication Unit

Communication System	Bluetooth Version 3.0
Communication Profile	SPP (Serial Port Profile)
Transmission Distance	Approx. 10 m max. (Output power: Class 2) *

* It depends on use environment conditions.

List of Models/Response Time/Current Consumption/Weight

F3SG-4RA□□□□-14/F3SG-2RA□□□□-14

Model		Number of Beams	Protective Height [mm]	Response Time [ms]			Current Consumption [mA]		Weight [kg][*2]
				ON → OFF[*1]	OFF (Synchronized) → ON	OFF (Not synchronized) → ON	Emitter	Receiver	
F3SG-4RA0160-14	**F3SG-2RA0160-14**	15	160	8	40	140	40	75	1.8
F3SG-4RA0240-14	**F3SG-2RA0240-14**	23	240	8	40	140	45	75	2.0
F3SG-4RA0320-14	**F3SG-2RA0320-14**	31	320	8	40	140	55	75	2.2
F3SG-4RA0400-14	**F3SG-2RA0400-14**	39	400	8	40	140	60	80	2.7
F3SG-4RA0480-14	**F3SG-2RA0480-14**	47	480	13	65	165	50	80	2.9
F3SG-4RA0560-14	**F3SG-2RA0560-14**	55	560	13	65	165	55	80	3.1
F3SG-4RA0640-14	**F3SG-2RA0640-14**	63	640	13	65	165	60	85	3.3
F3SG-4RA0720-14	**F3SG-2RA0720-14**	71	720	13	65	165	65	85	3.9
F3SG-4RA0800-14	**F3SG-2RA0800-14**	79	800	13	65	165	65	90	4.1
F3SG-4RA0880-14	**F3SG-2RA0880-14**	87	880	13	65	165	70	90	4.3
F3SG-4RA0960-14	**F3SG-2RA0960-14**	95	960	13	65	165	75	90	4.5
F3SG-4RA1040-14	**F3SG-2RA1040-14**	103	1040	13	65	165	80	95	4.7
F3SG-4RA1120-14	**F3SG-2RA1120-14**	111	1120	13	65	165	85	95	4.8
F3SG-4RA1200-14	**F3SG-2RA1200-14**	119	1200	13	65	165	90	100	5.0
F3SG-4RA1280-14	**F3SG-2RA1280-14**	127	1280	13	65	165	95	100	5.2
F3SG-4RA1360-14	**F3SG-2RA1360-14**	135	1360	13	65	165	95	105	5.6
F3SG-4RA1440-14	**F3SG-2RA1440-14**	143	1440	18	90	190	85	105	5.8
F3SG-4RA1520-14	**F3SG-2RA1520-14**	151	1520	18	90	190	90	105	6.0
F3SG-4RA1600-14	**F3SG-2RA1600-14**	159	1600	18	90	190	90	110	6.6
F3SG-4RA1680-14	**F3SG-2RA1680-14**	167	1680	18	90	190	95	110	6.8
F3SG-4RA1760-14	**F3SG-2RA1760-14**	175	1760	18	90	190	100	115	7.0
F3SG-4RA1840-14	**F3SG-2RA1840-14**	183	1840	18	90	190	100	115	7.2
F3SG-4RA1920-14	**F3SG-2RA1920-14**	191	1920	18	90	190	105	120	7.3
F3SG-4RA2000-14	**F3SG-2RA2000-14**	199	2000	18	90	190	105	120	7.5
F3SG-4RA2080-14	**F3SG-2RA2080-14**	207	2080	18	90	190	110	125	8.1

*1 The response times are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.
*2 The weight includes an emitter, a receiver and included brackets in a product package.

F3SG-4RA□□□□-30/F3SG-2RA□□□□-30

Model		Number of Beams	Protective Height [mm]	Response Time [ms]			Current Consumption [mA]		Weight [kg][*2]
				ON → OFF[*1]	OFF (Synchronized) → ON	OFF (Not synchronized) → ON	Emitter	Receiver	
F3SG-4RA0190-30	**F3SG-2RA0190-30**	8	190	8	40	140	35	75	1.8
F3SG-4RA0270-30	**F3SG-2RA0270-30**	12	270	8	40	140	35	75	2.0
F3SG-4RA0350-30	**F3SG-2RA0350-30**	16	350	8	40	140	40	75	2.2
F3SG-4RA0430-30	**F3SG-2RA0430-30**	20	430	8	40	140	45	75	2.7
F3SG-4RA0510-30	**F3SG-2RA0510-30**	24	510	8	40	140	50	75	2.9
F3SG-4RA0590-30	**F3SG-2RA0590-30**	28	590	8	40	140	50	75	3.1
F3SG-4RA0670-30	**F3SG-2RA0670-30**	32	670	8	40	140	55	75	3.3
F3SG-4RA0750-30	**F3SG-2RA0750-30**	36	750	8	40	140	60	80	3.9
F3SG-4RA0830-30	**F3SG-2RA0830-30**	40	830	8	40	140	65	80	4.0
F3SG-4RA0910-30	**F3SG-2RA0910-30**	44	910	13	65	165	50	80	4.2
F3SG-4RA0990-30	**F3SG-2RA0990-30**	48	990	13	65	165	50	80	4.4
F3SG-4RA1070-30	**F3SG-2RA1070-30**	52	1070	13	65	165	55	80	4.6
F3SG-4RA1150-30	**F3SG-2RA1150-30**	56	1150	13	65	165	55	85	4.8
F3SG-4RA1230-30	**F3SG-2RA1230-30**	60	1230	13	65	165	55	85	4.9
F3SG-4RA1310-30	**F3SG-2RA1310-30**	64	1310	13	65	165	60	85	5.1
F3SG-4RA1390-30	**F3SG-2RA1390-30**	68	1390	13	65	165	60	85	5.6
F3SG-4RA1470-30	**F3SG-2RA1470-30**	72	1470	13	65	165	65	85	5.8
F3SG-4RA1550-30	**F3SG-2RA1550-30**	76	1550	13	65	165	65	90	6.0
F3SG-4RA1630-30	**F3SG-2RA1630-30**	80	1630	13	65	165	70	90	6.5
F3SG-4RA1710-30	**F3SG-2RA1710-30**	84	1710	13	65	165	70	90	6.7
F3SG-4RA1790-30	**F3SG-2RA1790-30**	88	1790	13	65	165	70	90	6.9
F3SG-4RA1870-30	**F3SG-2RA1870-30**	92	1870	13	65	165	75	90	7.1
F3SG-4RA1950-30	**F3SG-2RA1950-30**	96	1950	13	65	165	75	95	7.3
F3SG-4RA2030-30	**F3SG-2RA2030-30**	100	2030	13	65	165	80	95	7.4
F3SG-4RA2110-30	**F3SG-2RA2110-30**	104	2110	13	65	165	80	95	8.0
F3SG-4RA2190-30	**F3SG-2RA2190-30**	108	2190	13	65	165	85	95	8.2
F3SG-4RA2270-30	**F3SG-2RA2270-30**	112	2270	13	65	165	85	100	8.4
F3SG-4RA2350-30	**F3SG-2RA2350-30**	116	2350	13	65	165	85	100	8.8
F3SG-4RA2430-30	**F3SG-2RA2430-30**	120	2430	13	65	165	90	100	8.9
F3SG-4RA2510-30	**F3SG-2RA2510-30**	124	2510	13	65	165	90	100	9.1

*1 The response times are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.
The maximum speed of movement of a test rod up to which the detection capability is maintained is 2.0 m/s.
*2 The weight includes an emitter, a receiver and included brackets in a product package.

Legislation and Standards

1. The F3SG-R does not receive type approval provided by Article 44-2 of the Industrial Safety and Health Act of Japan. When using the F3SG-R in Japan as a "safety system for pressing or shearing machines" prescribed in Article 42 of that law, the machine control system must receive type approval.
2. The F3SG-R is electro-sensitive protective equipment (ESPE) in accordance with European Union (EU) Machinery Directive Index Annex V, Item 2.
3. EC Declaration of Conformity
   OMRON declares that the F3SG-R is in conformity with the requirements of the following EC Directives:
   Machinery Directive 2006/42/EC
   EMC Directive 2004/108/EC
4. Conforming Standards
   (1) European standards
      EN61496-1 (Type 4 and Type 2 ESPE), EN 61496-2 (Type 4 and Type 2 AOPD), EN61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
   (2) International standards
      IEC61496-1 (Type 4 and Type 2 ESPE), IEC61496-2 (Type 4 and Type 2 AOPD), IEC61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), ISO 13849-1:2006 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
   (3) JIS standards
      JIS B 9704-1 (Type 4 and Type 2 ESPE), JIS B 9704-2 (Type 4 and Type 2 AOPD)
   (4) North American standards
      UL61496-1(Type 4 and Type 2 ESPE), UL61496-2(Type 4 and Type 2 AOPD), UL508, UL1998,
      CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
   (5) Chinese standards
      GB4584(Specification of active opto-electronic protective devices for presses)
5. Third-Party Certifications
   (1) TÜV SÜD
      - EC Type-Examination certificate:
        EU Machinery Directive, Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN 61496-2)
      - Certificate:
        Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN61496-2), EN 61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4, and PL c, Category 2 for Type 2)
   (2) UL
      - UL Listing:
        Type 4 and Type 2 ESPE (UL61496-1), Type 4 and Type 2 AOPD (UL61496-2), UL508, UL1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
   (3) China National Casting and Forging Machines Quality Supervision and Inspection Center
      - Certificate:
        GB4584 (Specification of active opto-electronic protective devices for presses)
6. Other Standards
   The F3SG-R is designed according to the standards listed below. To make sure that the final system complies with the following standards and regulations, you are asked to design and use it in accordance with all other related standards, laws, and regulations. If you have any questions, consult with specialized organizations such as the body responsible for prescribing and/or enforcing machinery safety regulations in the location where the equipment is to be used.
   - European Standards: EN415-4, EN691-1, EN692, EN693, IEC/TS 62046
   - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.212
   - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.217
   - American National Standards: ANSI B11.1 to B11.19
   - American National Standards: ANSI/RIA R15.06
   - Canadian Standards Association CSA Z142, Z432, Z434
   - SEMI Standards SEMI S2
   - Japan Ministry of Health, Labour and Welfare "Guidelines for Comprehensive Safety Standards of Machinery", Standard Bureau's Notification No. 0731001 dated July 31, 2007.rms and Conditions Agreement
   - Chinese National Standards: GB17120, GB27607

Indicator

Emitter

Name of Indicator		Color	Illuminated	Blinking
Test	TEST	Green	–	External Test is being performed
Operating range	LONG	Green	Long range mode is selected	Lockout state due to DIP Switch setting error or Operating range selection setting error
Power	POWER	Green	Power is ON.	Error due to noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in emitter

Receiver

Name of Indicator		Color	Illuminated	Blinking
Top-beam-state	TOP	Blue	The top beam is unblocked	Muting/Override state, or Lockout state due to Cap error or Other sensor error
PNP/NPN mode	NPN	Green	NPN mode is selected by DIP Switch	–
Response time	SLOW	Green	Response Time Adjustment is enabled	–
Sequence error	SEQ	Yellow	–	Sequence error in Muting or Pre-reset mode
Blanking	BLANK	Green	Blanking, Warning Zone or Reduced Resolution is enabled	Teach-in mode, or Blanking Monitoring error
Configuration	CFG	Green	–	Teach-in mode, zone measurement beng performed by Dynamic Muting, or Lockout state due to Parameter error or Cascading Configuration error
Interlock	INT-LK	Yellow	Interlock state	Pre-reset mode
External device monitoring	EDM	Green	RESET input is in ON state	Lockout state due to EDM error
Internal error	INTERNAL	Red	–	Lockout state due to Internal error, or error due to abnormal power supply or noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in receiver
Stable-state	STB	Green	Incident light level is 170% or higher of ON-threshold	Safety output is instantaneously turned OFF due to ambient light or vibration
ON/OFF	ON/OFF	Green	Safety output is in ON state	–
		Red	Safety output is in OFF state, or the sensor is in Setting state	Lockout state due to Safety Output error, or error due to abnormal power supply or noise
Communication	COM	Green	Synchronization between emitter and receiver is maintained	Lockout state due to Communication error, or error due to abnormal power supply or noise
Bottom-beam-state	BTM	Blue	The bottom beam is unblocked	Muting/Override state, or Lockout state due to DIP Switch setting error

Interface Unit

Main unit	PC/AT compatible machine (computer that runs Microsoft Windows)
Operating system (OS)	Windows 7 (32-bit/64-bit), Windows 8 (32-bit/64-bit)
Communication port	USB port ×1
Ambient temperature	Operating: -10 to 55°C, Storage: -30 to 70°C(non-icing and non-condensing)
Ambient humidity	Operating: 35% to 85%, Storage: 35% to 95%(non-condensing)

Lamp

Item	F39-LP
Applicable Sensor	F3SG-☐RA Series Safety Light Curtain (Receiver)
LED Light Color	Red/Green/Orange
Power Supply Voltage	24 VDC±20%, ripple p-p 10% max.(shares sensor's power supply)
Current Consumption	25 mA max. (shares sensor's power supply.)
Ambient Temperature	Operating: -10 to 55°C, Storage: -25 to 70°C
Ambient Humidity	Operating: 35% to 85%, Storage: 35% to 95%
Vibration Resistance	10 to 55 Hz, Multiple amplitude of 0.7 mm,20 sweeps for all 3 axes
Shock Resistance	100 m/s^2 , 1000 shocks for all 3 axes
Degree of Protection	IP65 and IP67(When attached to F3SG)
Type of Connection	Connectable to F3SG-RA's terminal connector
Material	Lighting element: PC, Other body parts: PBT
Weight	45 g (when packaged)

Connections (Basic Wiring Diagram)

Standalone F3SG-RA using PNP Outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, PNP output and External Test in 24 V Active.

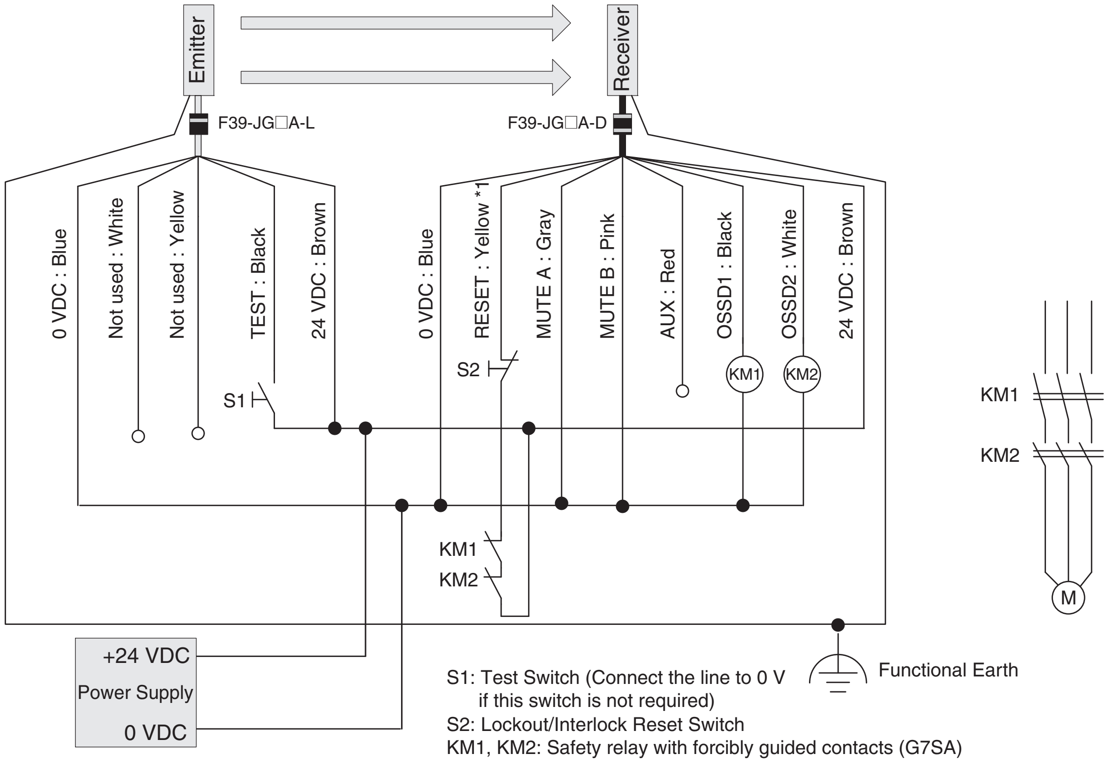
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Manual Reset	3 ■□ ON	3 ■□ ON
		4 □■ ON	4 □■ ON
	PNP (factory default setting)	7 □■ ON	7 □■ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □■ ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example

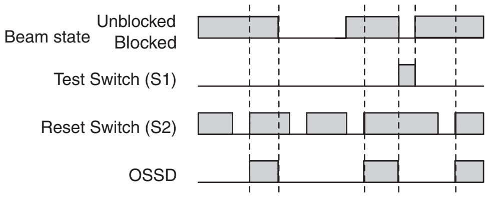


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
S1
S2
KM1
KM2
KM1
KM2
KM1
KM2
M
+24 VDC
Power Supply
0 VDC
Functional Earth

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch
KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
M: 3-phase motor

*1.Also used as EDM input line.

*2.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Beam state
Unblocked
Blocked
Test Switch (S1)
Reset Switch (S2)
OSSD

Note: The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information.

Standalone F3SG-RA with Y-Joint Plug/Socket Connector using PNP outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, PNP output and External Test in 24 V Active.

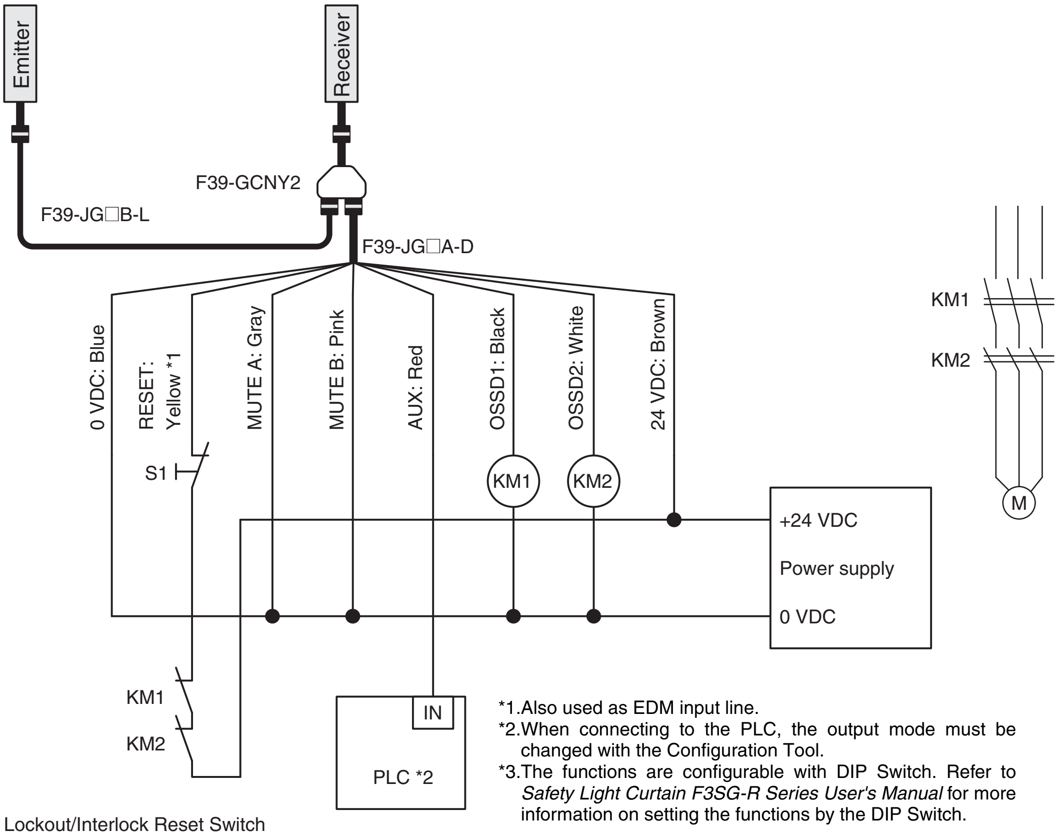
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Manual Reset	3 ■□ ON	3 ■□ ON
		4 □■ ON	4 □■ ON
	PNP (factory default setting)	7 □■ ON	7 □■ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □■ ON	

□: Indicates a switch position.

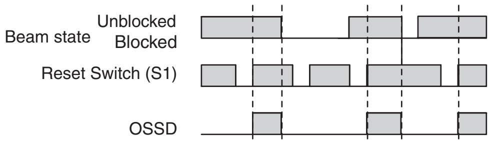
Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-GCNY2
F39-JG□B-L
F39-JG□A-D
0 VDC: Blue
RESET: Yellow *1
MUTE A: Gray
MUTE B: Pink
AUX: Red
OSSD1: Black
OSSD2: White
24 VDC: Brown
S1
KM1
KM2
+24 VDC
Power supply
0 VDC
KM1
KM2
M
KM1
KM2
IN
PLC *2

S1: Lockout/Interlock Reset Switch
KM1,KM2: External device feedback
M: 3-phase motor
PLC: Programmable controller
(Used for monitoring only. NOT related to safety system.)

*1.Also used as EDM input line.
*2.When connecting to the PLC, the output mode must be changed with the Configuration Tool.
*3.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



F3SG-RA with Y-Joint Plug/Socket Connector in Standard Muting Mode/Exit-Only Muting Mode using PNP outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

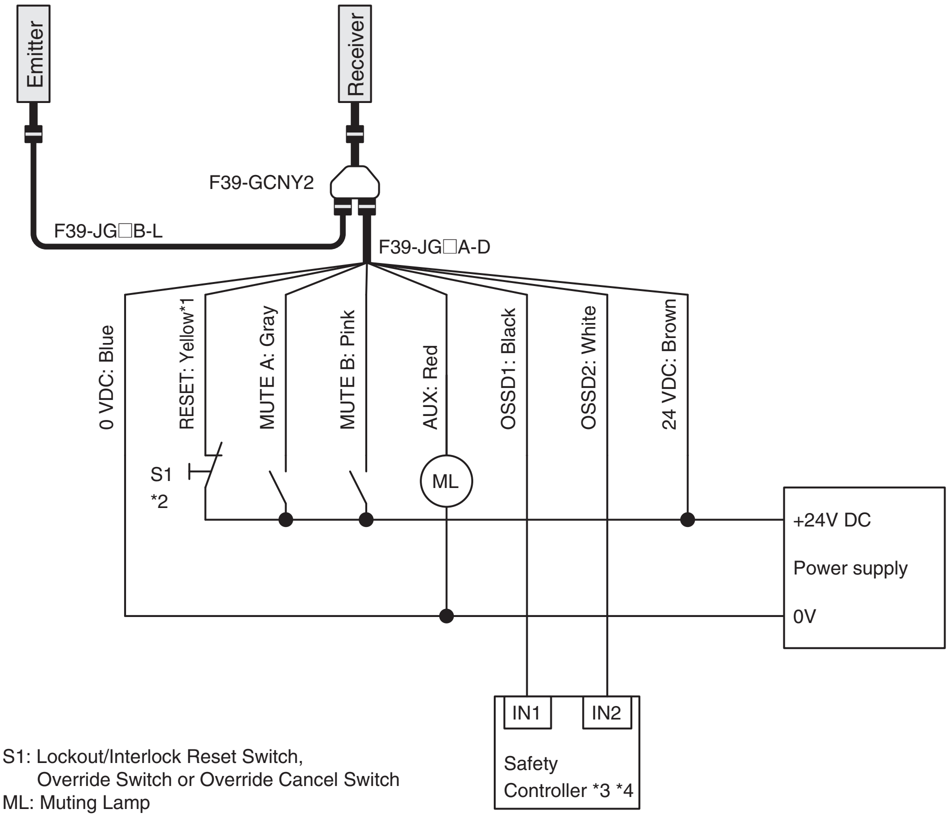
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 □ ON	2 □ ON
	Auto Reset (factory default setting)	3 □ ON	3 □ ON
		4 □ ON	4 □ ON
	PNP (factory default setting)	7 □ ON	7 □ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □ ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-GCNY2
F39-JG□B-L
F39-JG□A-D
0 VDC: Blue
RESET: Yellow*1
MUTE A: Gray
MUTE B: Pink
AUX: Red
OSSD1: Black
OSSD2: White
24 VDC: Brown
S1
*2
ML
+24V DC
Power supply
0V
IN1
IN2
Safety
Controller *3 *4

S1: Lockout/Interlock Reset Switch,
Override Switch or Override Cancel Switch
ML: Muting Lamp

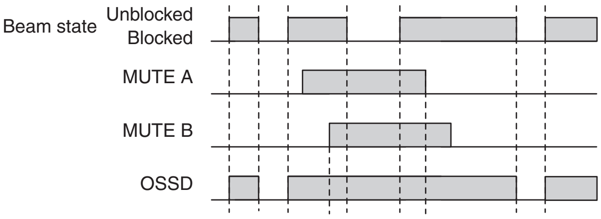
*1.Also used as EDM input line.

*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

*3.Refer to page 27 for more information.

*4.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.

*5.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

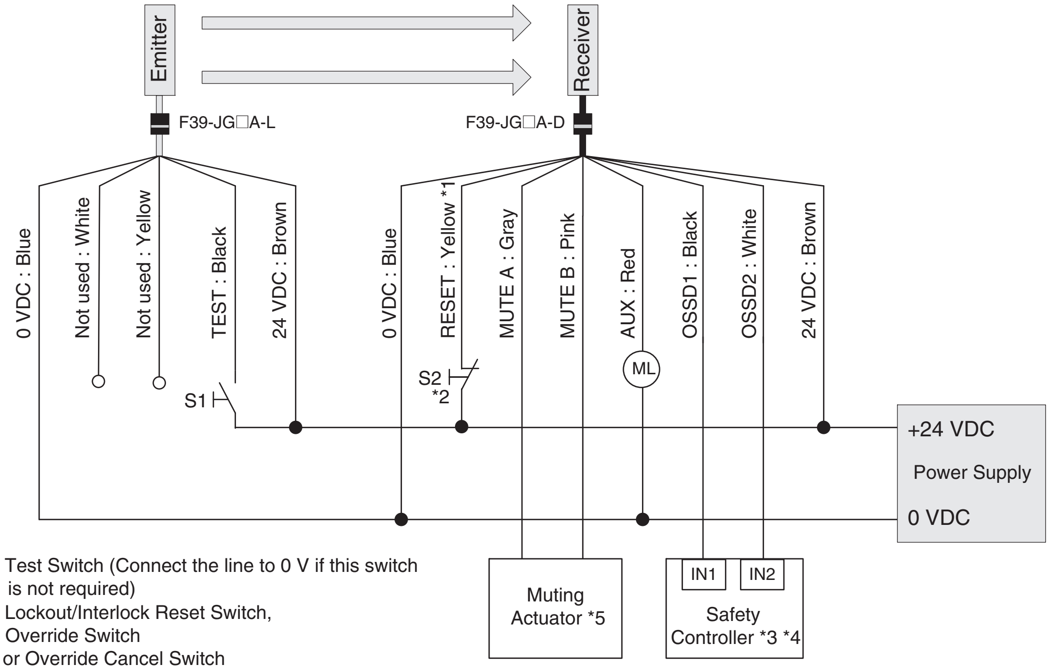
DIP Switch settings *6

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ☐■ ON	2 ☐■ ON
	Auto Reset (factory default setting)	3 ☐■ ON 4 ☐■ ON	3 ☐■ ON 4 ☐■ ON
	PNP (factory default setting)	7 ☐■ ON	7 ☐■ ON
Emitter	External Test: 24 V Active (factory default setting)	4 ☐■ ON	

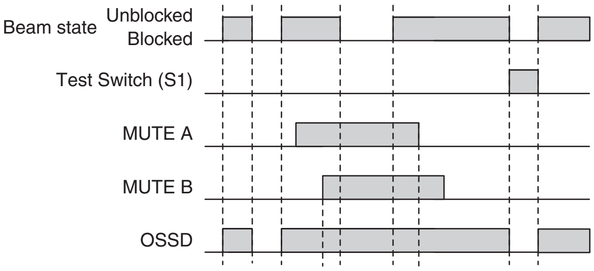
☐: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
S1
S2
*2
ML
+24 VDC
Power Supply
0 VDC
Muting Actuator *5
IN1
IN2
Safety Controller *3 *4

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch,
Override Switch
or Override Cancel Switch
ML: Muting lamp


Beam state
Unblocked
Blocked
Test Switch (S1)
MUTE A
MUTE B
OSSD

---

*1.Also used as Override input line.
*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
*3.Refer to page 27 for more information.
*4.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
*5.Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.
*6.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

Standard Muting Mode/Exit-Only Muting Mode with two Muting Sensors using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

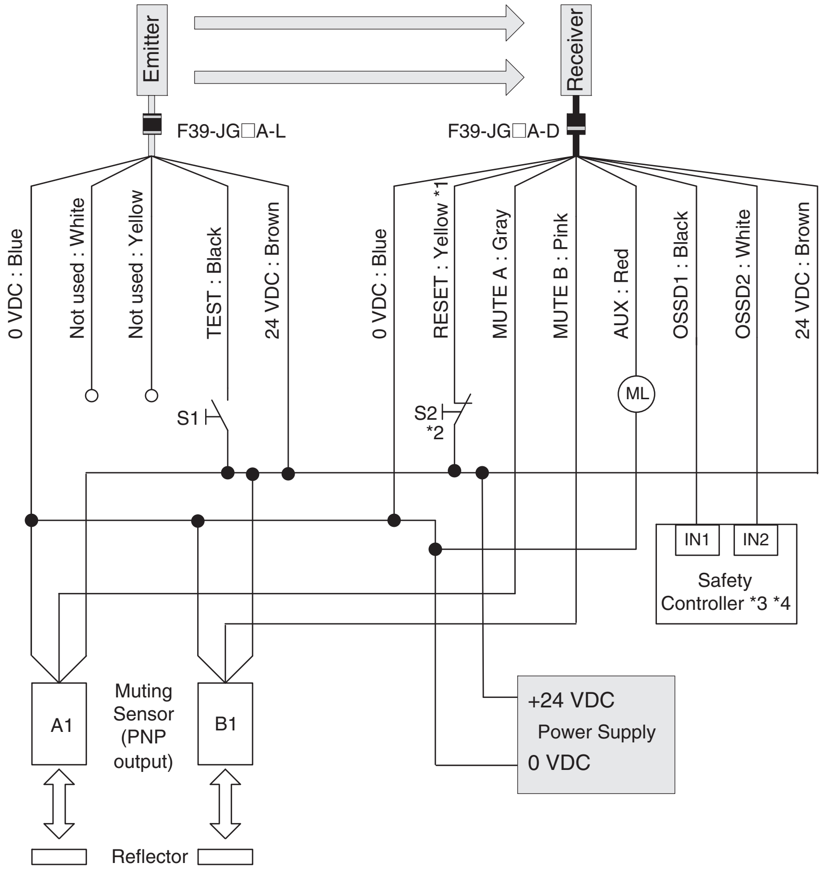
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 □■ ON	2 □■ ON
	Auto Reset (factory default setting)	3 □■ ON	3 □■ ON
		4 □■ ON	4 □■ ON
	PNP (factory default setting)	7 □■ ON	7 □■ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □■ ON	

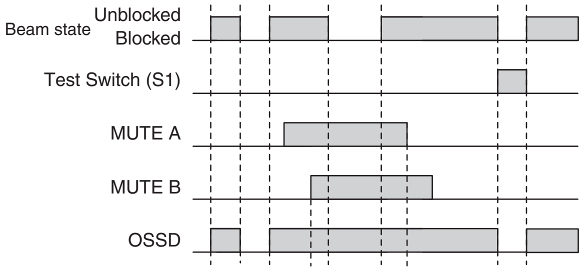
□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
S1
S2
*2
ML
IN1
IN2
Safety
Controller *3 *4
A1
Muting
Sensor
(PNP
output)
B1
+24 VDC
Power Supply
0 VDC
Reflector

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch,Override Switch or Override Cancel Switch
ML: Muting lamp
A1, B1: Muting sensor


Beam state
Unblocked
Blocked
Test Switch (S1)
MUTE A
MUTE B
OSSD

---

*1.Also used as Override input line.

*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

*3.Refer to page 27 for more information.

*4.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.

*5.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

Standard Muting Mode with four Muting Sensors using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

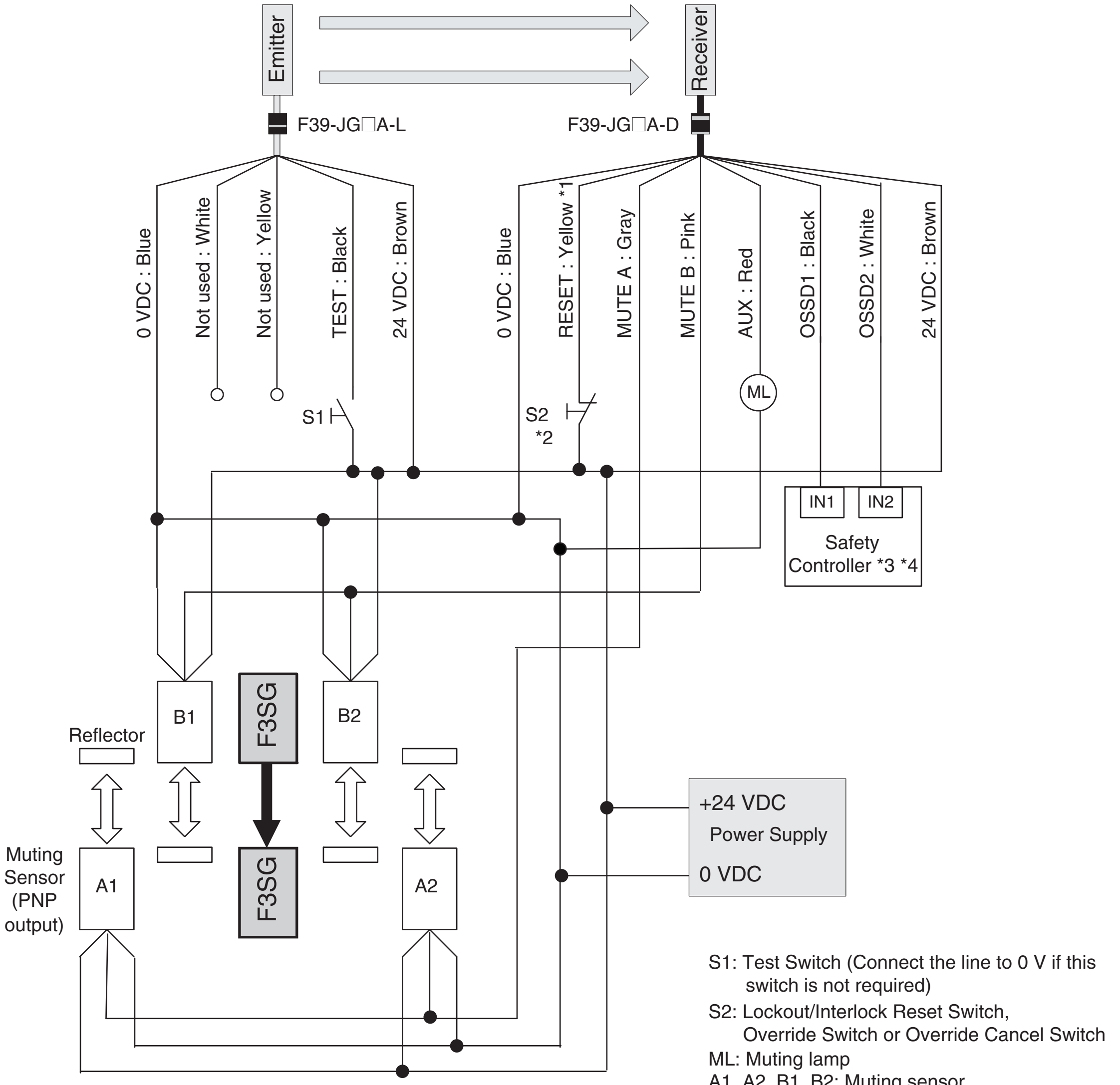
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ☐ ON	2 ☐ ON
	Auto Reset (factory default setting)	3 ☐ ON	3 ☐ ON
		4 ☐ ON	4 ☐ ON
	PNP (factory default setting)	7 ☐ ON	7 ☐ ON
Emitter	External Test: 24 V Active (factory default setting)	4 ☐ ON	

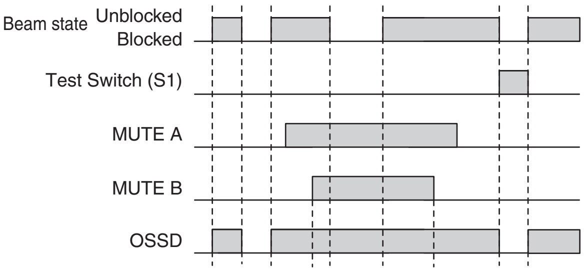
☐: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-JG☐A-L
F39-JG☐A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
S1
S2
*2
ML
IN1
IN2
Safety Controller *3 *4
Reflector
B1
F3SG
B2
Muting Sensor (PNP output)
A1
F3SG
A2
+24 VDC
Power Supply
0 VDC

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
ML: Muting lamp
A1, A2, B1, B2: Muting sensor



---

*1.Also used as Override input line.
*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
*3.Refer to page 27 for more information.
*4.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
*5.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

Pre-Resest Mode using PNP Output

The following is the example of External Device Monitoring disabled, Pre-Reset mode, PNP output and External Test in 24 V Active.

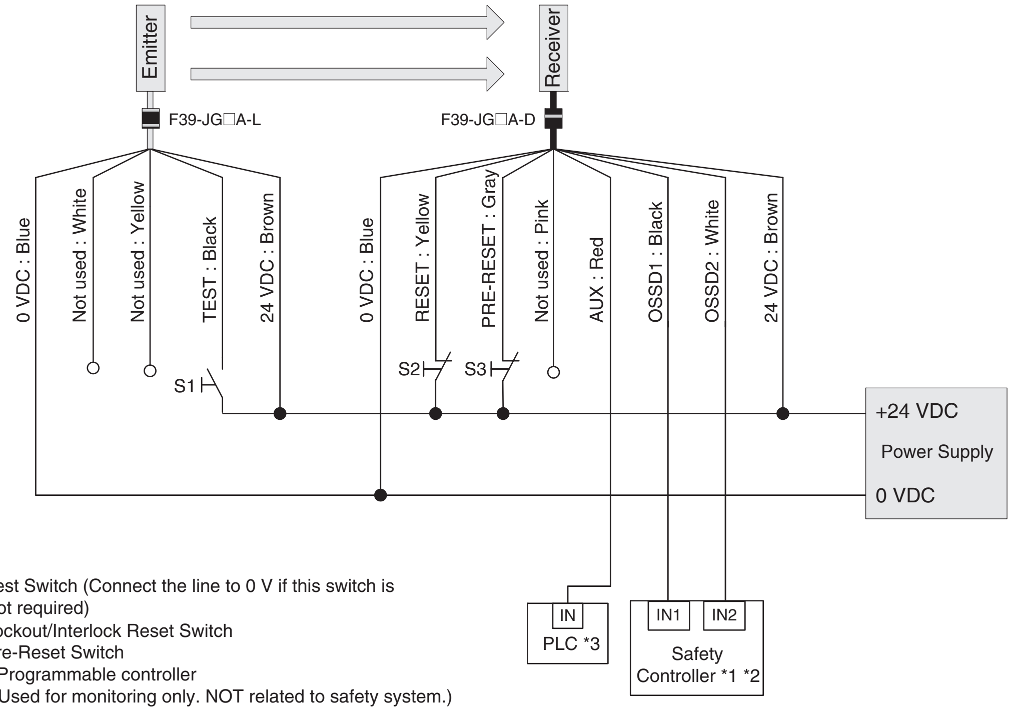
DIP Switch settings *4

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 □■ ON	2 □■ ON
	Pre-Reset	3 □■ ON 4 ■□ ON	3 □■ ON 4 ■□ ON
	PNP (factory default setting)	7 □■ ON	7 □■ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □■ ON	

□: Indicates a switch position.

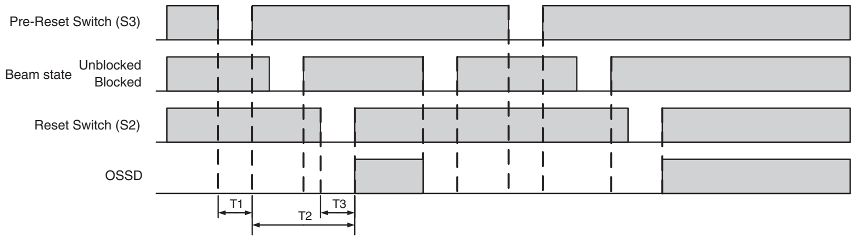
Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow
PRE-RESET : Gray
Not used : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
S1
S2
S3
+24 VDC
Power Supply
0 VDC
IN
PLC *3
IN1
IN2
Safety Controller *1 *2

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch
S3: Pre-Reset Switch
PLC: Programmable controller (Used for monitoring only. NOT related to safety system.)

*1.Refer to the following list "Connectable Safety Control Units" on this page.
*2.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
*3.When connecting to the PLC, the output mode must be changed with the Configuration Tool.
*4.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



T1: Push time: must be T1 >= 300ms
T2: Pre-reset limit time between Pre-reset and Reset: must be T2 <= 60s
T3: Push time: must be T3 >= 300ms

Connectable Safety Control Units

The F3SG-RA with PNP output can be connected to the safety control units listed in the table below.

Connectable Safety Control Units (PNP output)		
		G9SP-N10S
G9SA-301		**G9SP-N10D**
G9SA-321		**G9SP-N20S**
G9SA-501		**NE0A-SCPU01**
G9SB-200-B	**G9SX-AD322-T**	**NE1A-SCPU01**
G9SB-200-D	**G9SX-ADA222-T**	**NE1A-SCPU02**
G9SB-301-B	**G9SX-BC202**	**DST1-ID12SL**
G9SB-301-D	**G9SX-GS226-T15**	**DST1-MD16SL**
G9SE-201		**DST1-MRD08SL**
G9SE-401		**NX-SIH400**
G9SE-221-T□		**NX-SID800**
		F3SP-T01

Standalone F3SG-RA using NPN Outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, NPN output and External Test in 0 V Active.

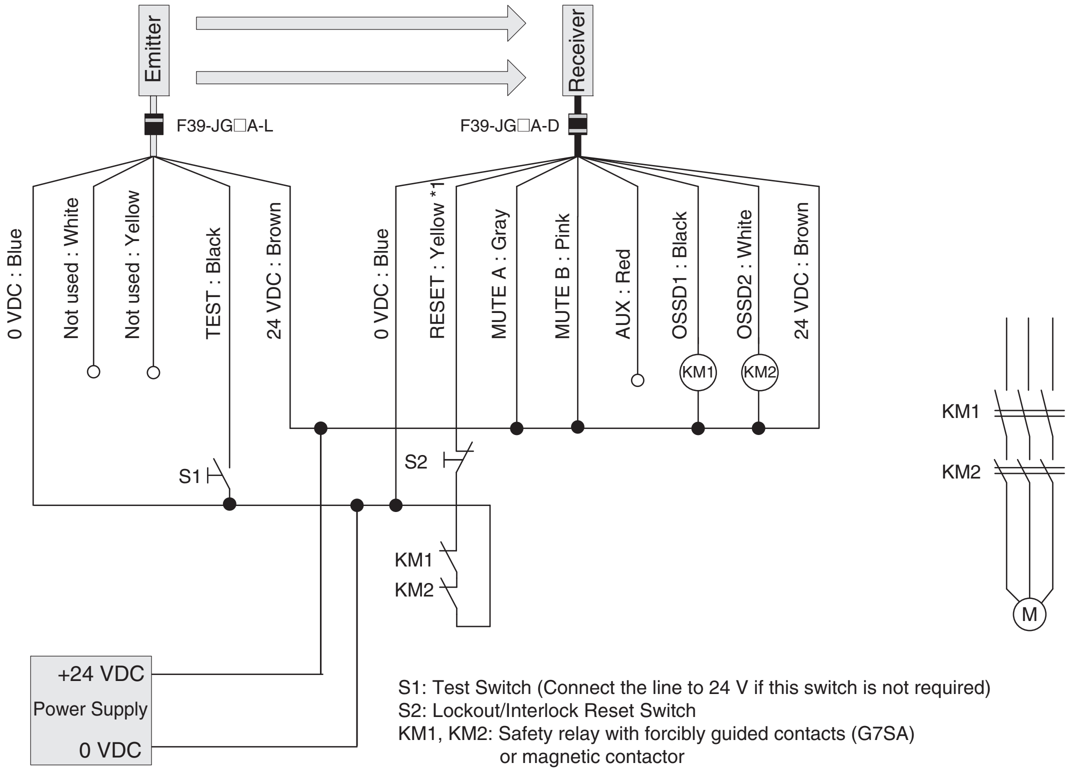
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Manual Reset	3 ■□ ON	3 ■□ ON
		4 □■ ON	4 □■ ON
	NPN	7 ■□ ON	7 ■□ ON
Emitter	External Test: 0 V Active	4 ■□ ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

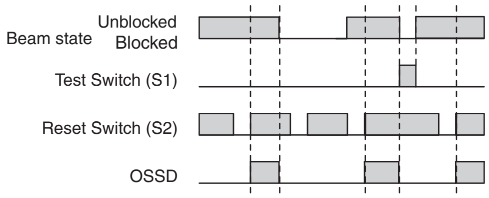
Wiring Example


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
KM1
KM2
S1
S2
KM1
KM2
KM1
KM2
M
+24 VDC
Power Supply
0 VDC

S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Lockout/Interlock Reset Switch
KM1, KM2: Safety relay with forcibly guided contacts (G7SA)
or magnetic contactor
M: 3-phase motor

*1.Also used as EDM input line.

*2.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standalone F3SG-RA with Y-Joint Plug/Socket Connector using NPN outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, NPN output and External Test in 24 V Active.

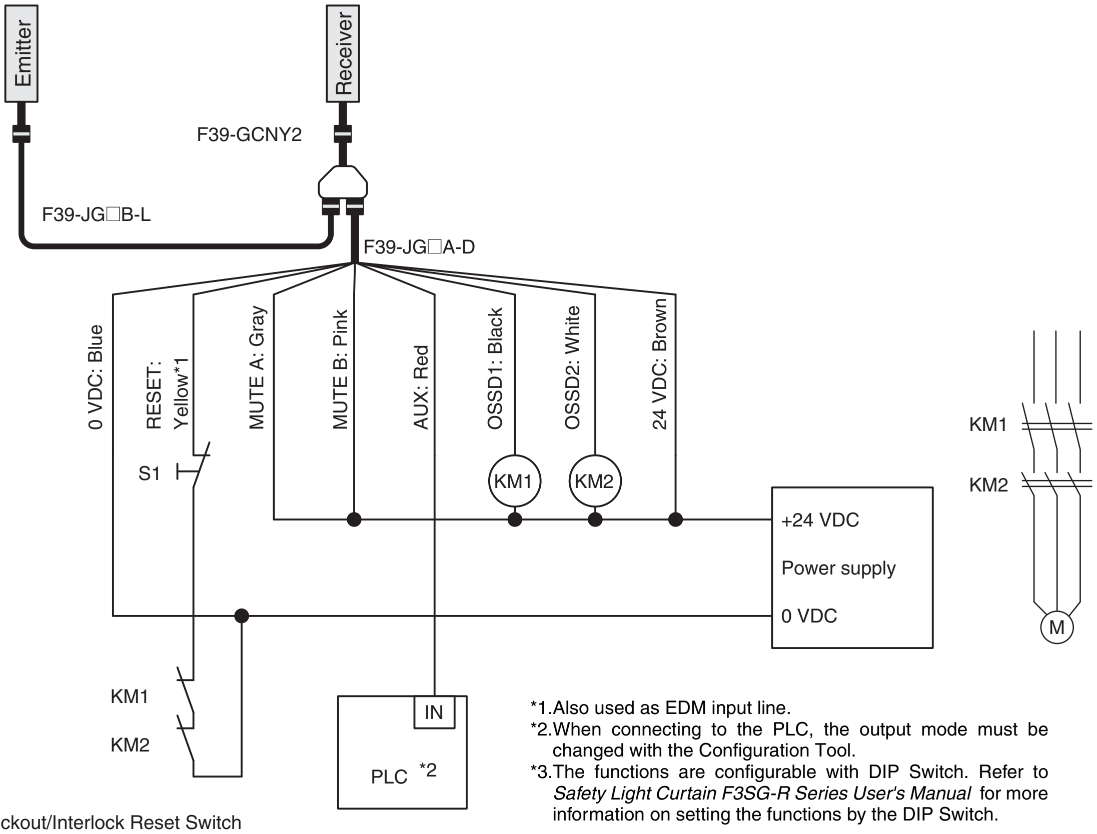
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Manual Reset	3 ■□ ON	3 ■□ ON
		4 □■ ON	4 □■ ON
	NPN	7 ■□ ON	7 ■□ ON
Emitter	External Test: 24 V Active (factory default setting)	4 □■ ON	

□: Indicates a switch position.

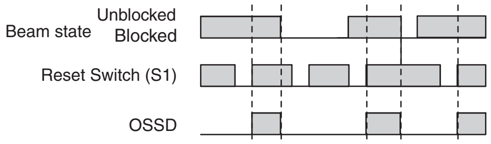
Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-GCNY2
F39-JG□B-L
F39-JG□A-D
0 VDC: Blue
RESET: Yellow*1
MUTE A: Gray
MUTE B: Pink
AUX: Red
OSSD1: Black
OSSD2: White
24 VDC: Brown
S1
KM1
KM2
+24 VDC
Power supply
0 VDC
KM1
KM2
M
KM1
KM2
IN
PLC *2

*1.Also used as EDM input line.
*2.When connecting to the PLC, the output mode must be changed with the Configuration Tool.
*3.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

S1: Lockout/Interlock Reset Switch
KM1,KM2: External device feedback
M: 3-phase motor
PLC: Programmable controller
(Used for monitoring only. NOT related to safety system.)


Beam state
Unblocked
Blocked
Reset Switch (S1)
OSSD

Standard Muting Mode/Exit-Only Muting Mode using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

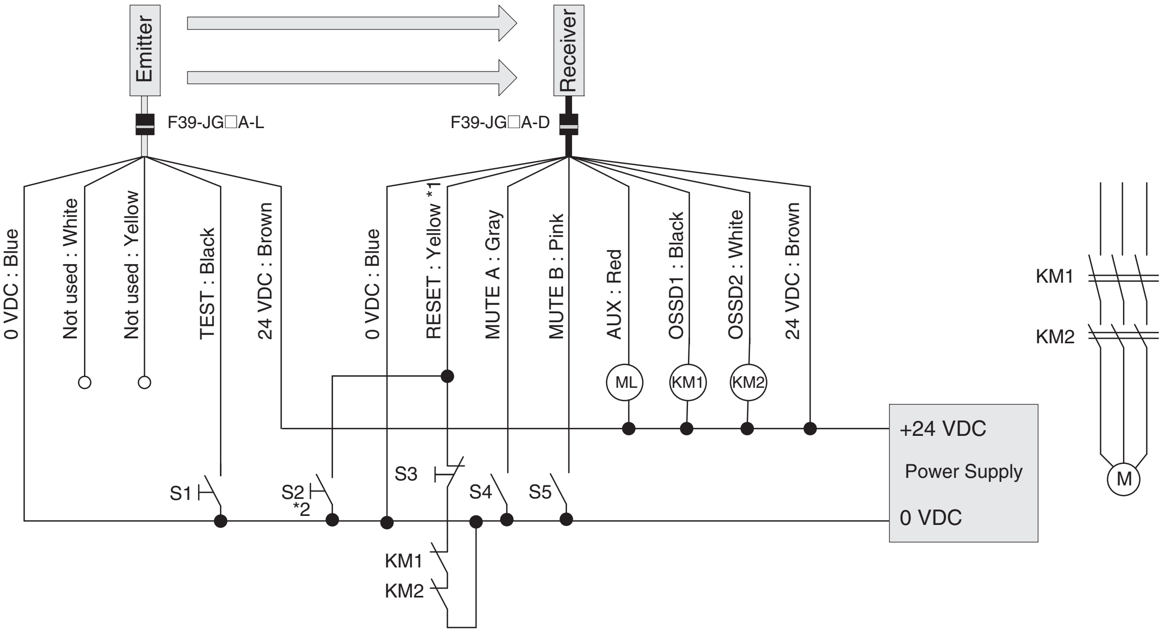
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Auto Reset (factory default setting)	3 □■ ON	3 □■ ON
		4 □■ ON	4 □■ ON
	NPN	7 ■□ ON	7 ■□ ON
Emitter	External Test: 0 V Active	4 ■□ ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example

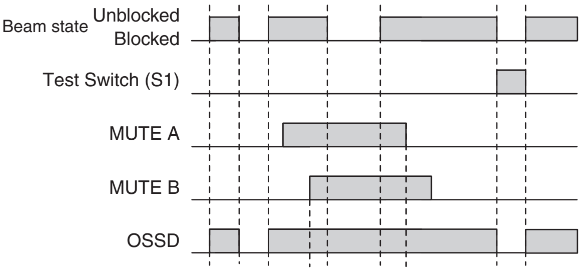

Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
ML
KM1
KM2
+24 VDC
Power Supply
0 VDC
S1
S2
*2
S3
S4
S5
KM1
KM2
KM1
KM2
M

S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Override Cancel Switch
S3: Lockout/Interlock Reset Switch or Override Switch
S4, S5: Muting sensor
KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
M: 3-phase motor
ML: Muting lamp

[*1] Also used as Override input line.

[*2] Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

[*3] The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode with two Muting Sensors using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

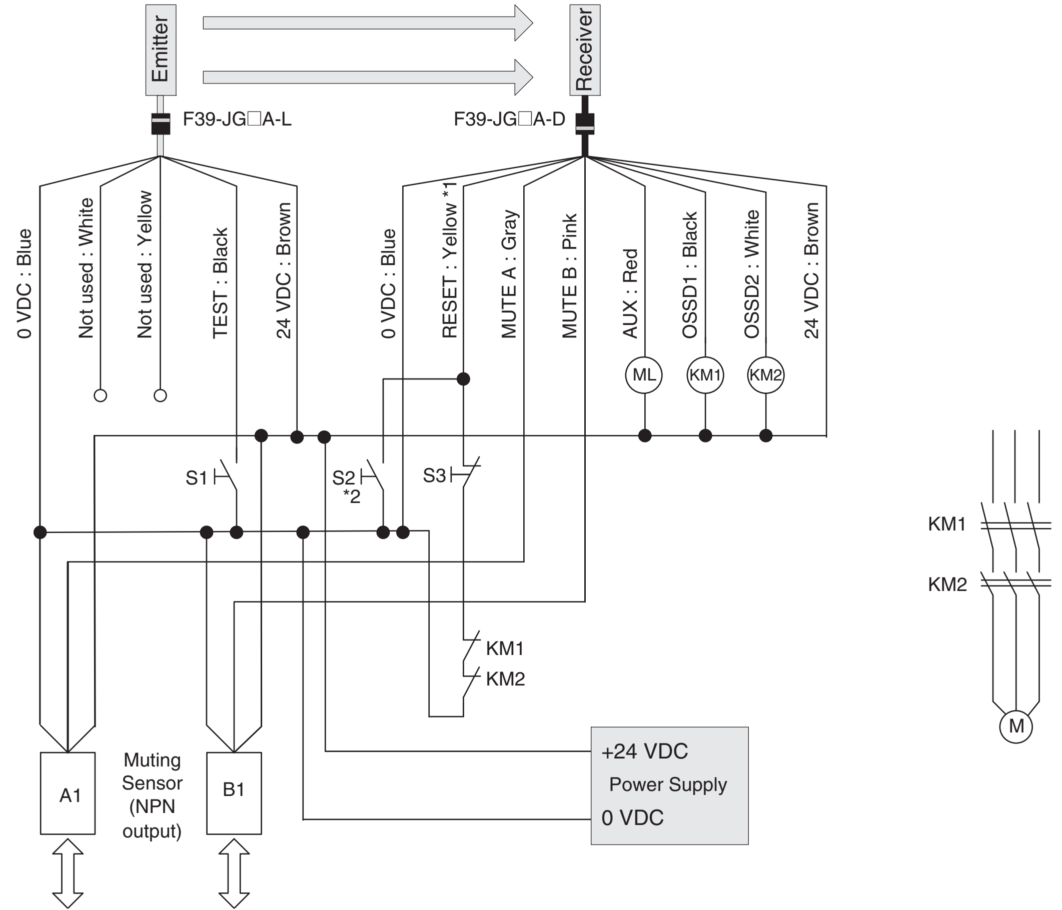
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Auto Reset (factory default setting)	3 □■ ON 4 □■ ON	3 □■ ON 4 □■ ON
	NPN	7 ■□ ON	7 ■□ ON
Emitter	External Test: 0 V Active	4 ■□ ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example

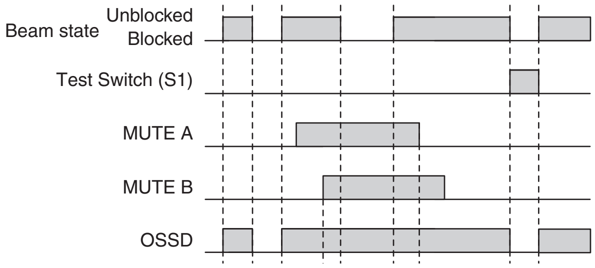

Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
ML
KM1
KM2
S1
S2
*2
S3
KM1
KM2
KM1
KM2
M
+24 VDC
Power Supply
0 VDC
A1
Muting Sensor (NPN output)
B1
Reflector

S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Override Cancel Switch
S3: Lockout/Interlock Reset Switch or Override Switch
KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
M: 3-phase motor
ML: Muting lamp
A1, B1: Muting sensor

*1.Also used as Override input line.

*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

*3.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode with four Muting Sensors using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

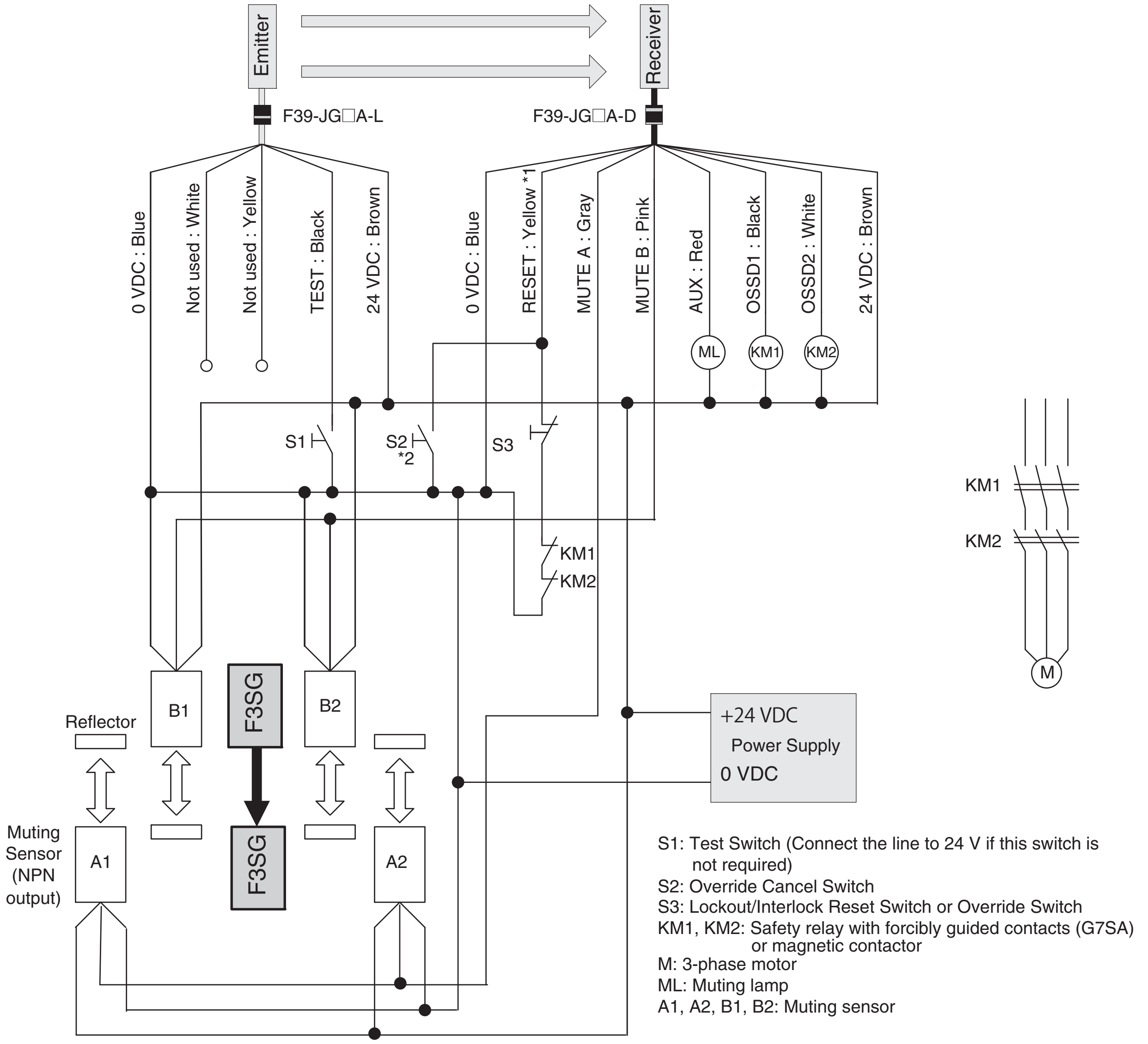
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■□ ON	2 ■□ ON
	Auto Reset (factory default setting)	3 □■ ON 4 □■ ON	3 □■ ON 4 □■ ON
	NPN	7 ■□ ON	7 ■□ ON
Emitter	External Test: 0 V Active	4 ■□ ON	

□: Indicates a switch position.

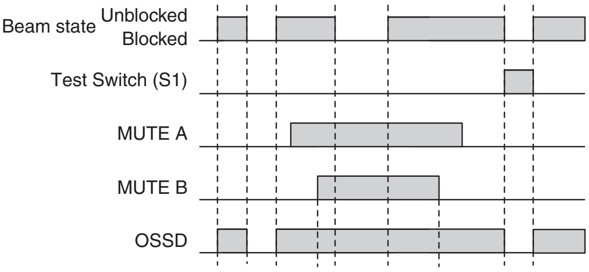
Configure functions with the DIP Switches before wiring.

Wiring Example



Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow *1
MUTE A : Gray
MUTE B : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
ML
KM1
KM2
S1
S2
*2
S3
KM1
KM2
KM1
KM2
M
Reflector
B1
F3SG
B2
Muting Sensor (NPN output)
A1
F3SG
A2
+24 VDC
Power Supply
0 VDC

S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Override Cancel Switch
S3: Lockout/Interlock Reset Switch or Override Switch
KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
M: 3-phase motor
ML: Muting lamp
A1, A2, B1, B2: Muting sensor



---

*1.Also used as Override input line.

*2.Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state maynot be released by the override cancel switch, resulting in serious injury.

*3.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

Pre-Resest Mode using NPN Output

The following is the example of External Device Monitoring enabled, Pre-Reset mode, NPN output and External Test in 0 V Active.

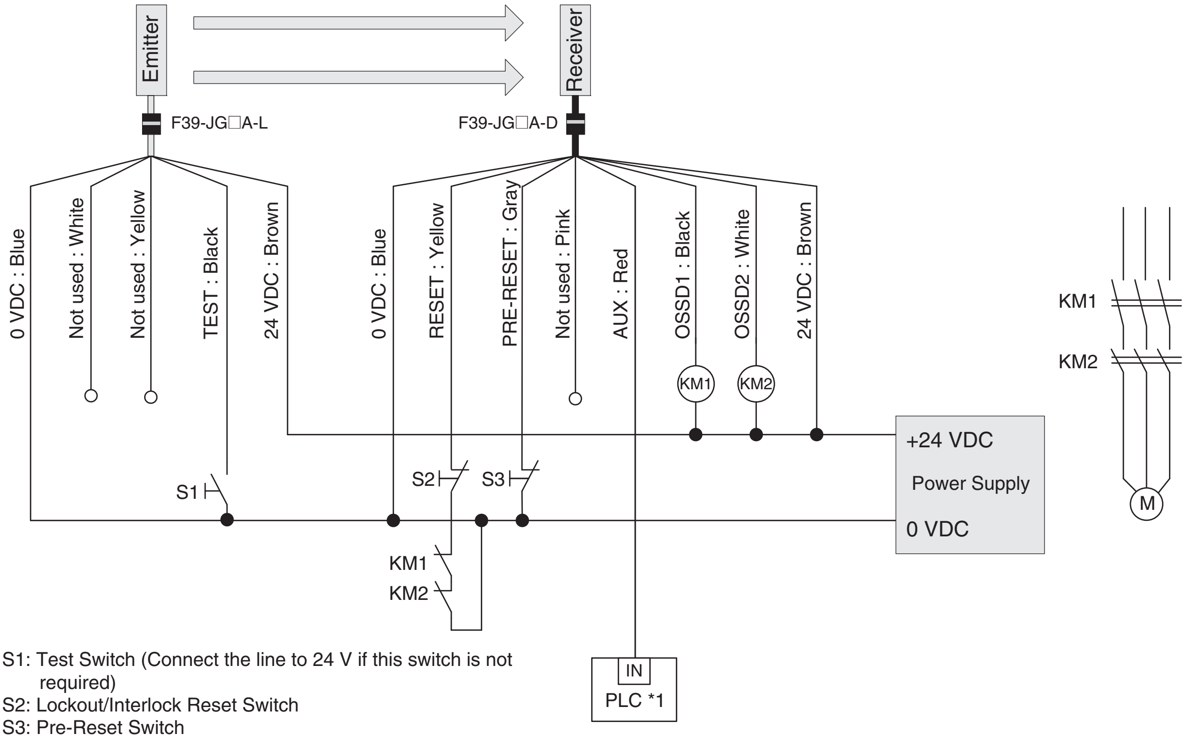
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ■☐ ON	2 ■☐ ON
	Pre-Reset	3 ☐■ ON 4 ■☐ ON	3 ☐■ ON 4 ■☐ ON
	NPN	7 ■☐ ON	7 ■☐ ON
Emitter	External Test: 0 V Active	4 ■☐ ON	

☐: Indicates a switch position.

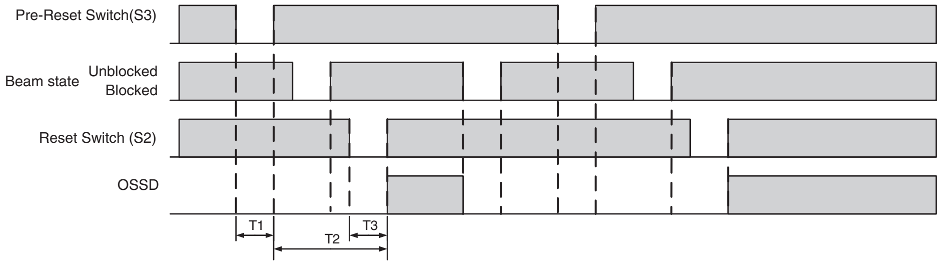
Configure functions with the DIP Switches before wiring.

Wiring Example


Emitter
Receiver
F39-JG□A-L
F39-JG□A-D
0 VDC : Blue
Not used : White
Not used : Yellow
TEST : Black
24 VDC : Brown
0 VDC : Blue
RESET : Yellow
PRE-RESET : Gray
Not used : Pink
AUX : Red
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
KM1
KM2
+24 VDC
Power Supply
0 VDC
S1
S2
S3
KM1
KM2
IN
PLC *1
KM1
KM2
M

S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Lockout/Interlock Reset Switch
S3: Pre-Reset Switch
KM1, KM2: External device feedback
M: 3-phase motor
PLC: Programmable controller
(Used for monitoring only. NOT related to safety system.)

*1.When connecting to the PLC, the output mode must be changed with the Configuration Tool.
*2.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



T1: Push time: must be T1 >= 300ms
T2: Pre-reset limit time between Pre-reset and Reset: must be T2 <= 60s
T3: Push time: must be T3 >= 300ms

The F3SG-RA with NPN output can be connected to the safety control unit listed in the table below.

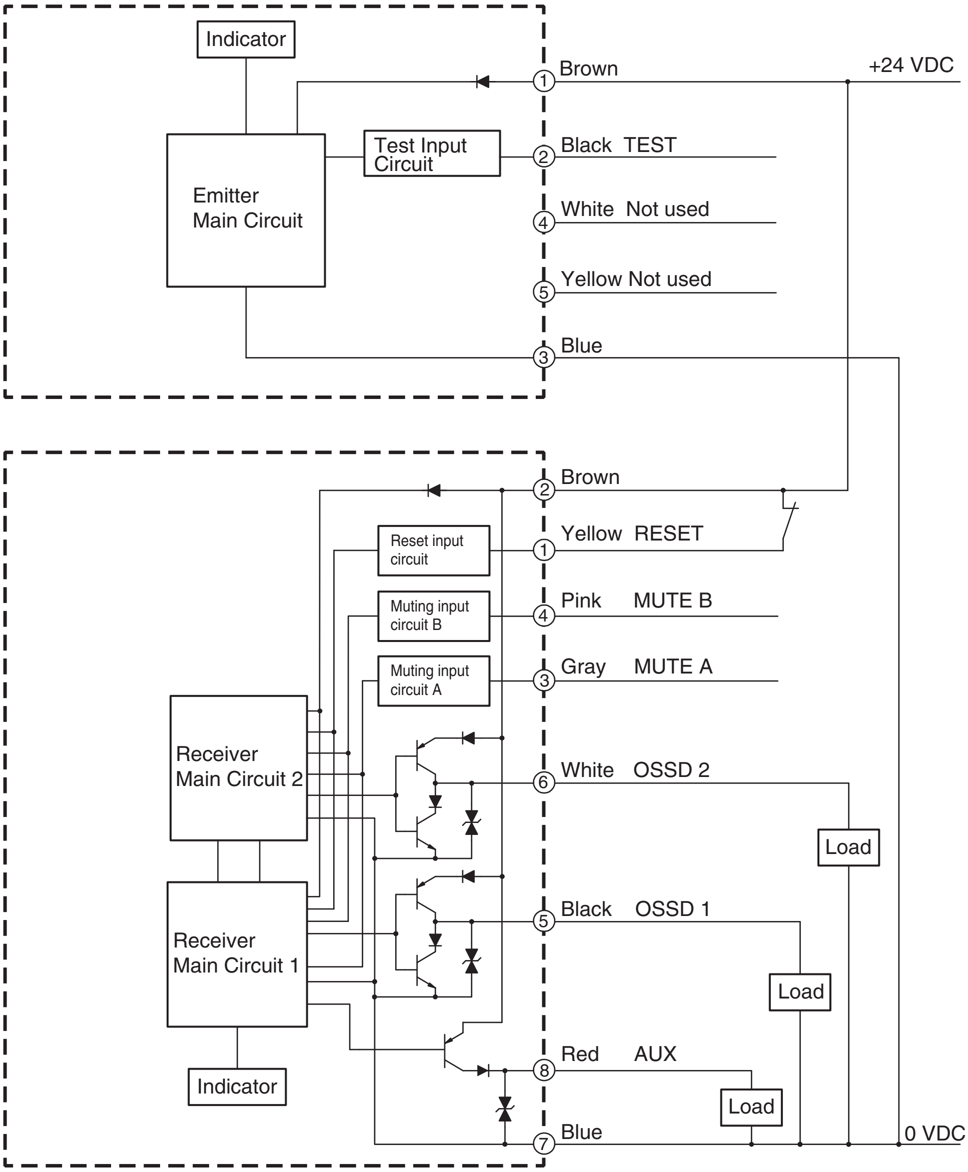
Connectable Safety Control Units (NPN output)
G9SA-301-P

Input/Output Circuit

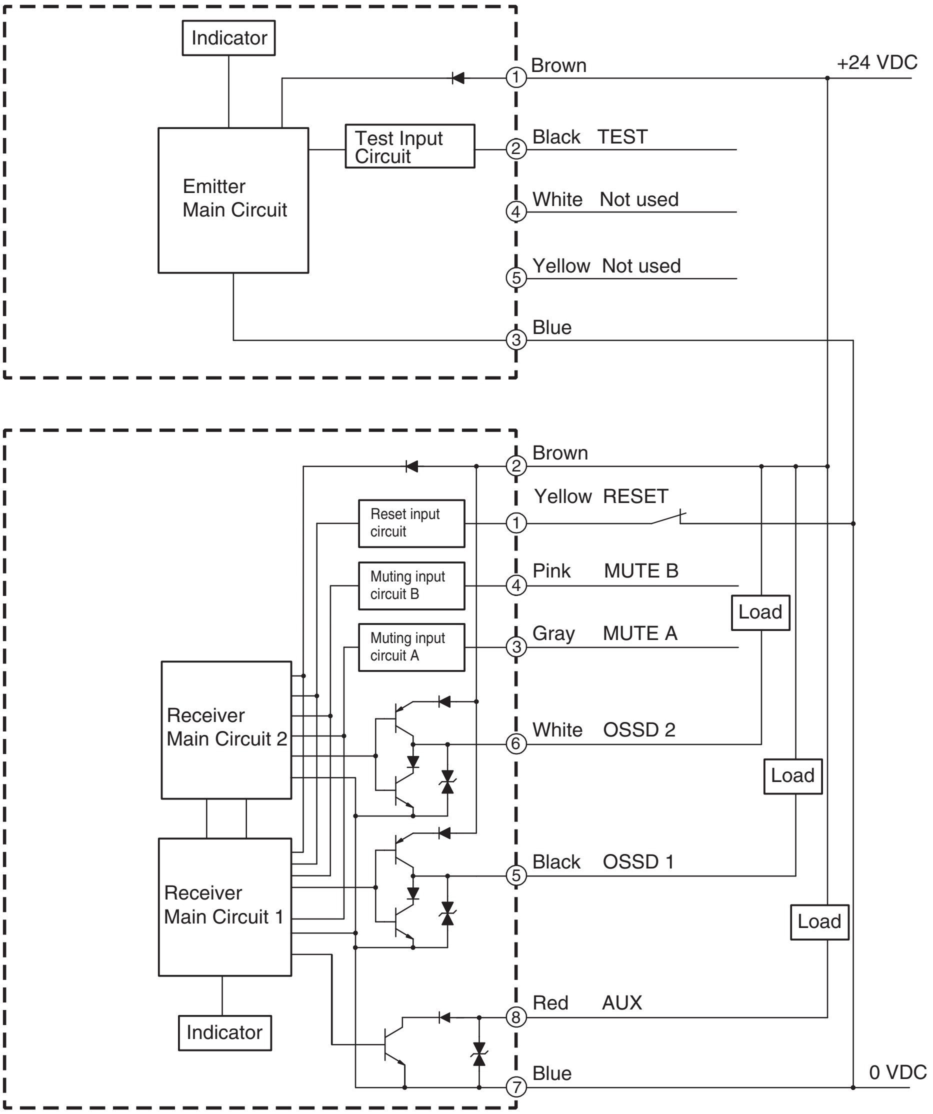
Entire Circuit Diagram

The entire circuit diagram of the F3SG-R is shown below.
The numbers in the circles indicate the connector's pin numbers.

PNP Output


Indicator
Emitter Main Circuit
Test Input Circuit
① Brown
+24 VDC
② Black TEST
④ White Not used
⑤ Yellow Not used
③ Blue
② Brown
Reset input circuit
① Yellow RESET
Muting input circuit B
④ Pink MUTE B
Muting input circuit A
③ Gray MUTE A
Receiver Main Circuit 2
⑥ White OSSD 2
Load
⑤ Black OSSD 1
Load
Receiver Main Circuit 1
⑧ Red AUX
Load
Indicator
⑦ Blue
0 VDC

NPN Output

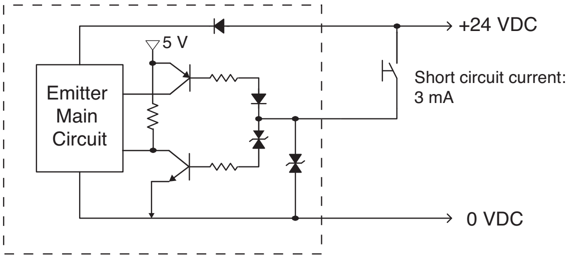

Indicator
Emitter Main Circuit
Test Input Circuit
① Brown +24 VDC
② Black TEST
④ White Not used
⑤ Yellow Not used
③ Blue
② Brown
Reset input circuit
① Yellow RESET
Muting input circuit B
④ Pink MUTE B
Muting input circuit A
③ Gray MUTE A
Load
Receiver Main Circuit 2
⑥ White OSSD 2
Load
Receiver Main Circuit 1
⑤ Black OSSD 1
Load
Indicator
⑧ Red AUX
⑦ Blue
0 VDC

Input Circuit Diagram by Function

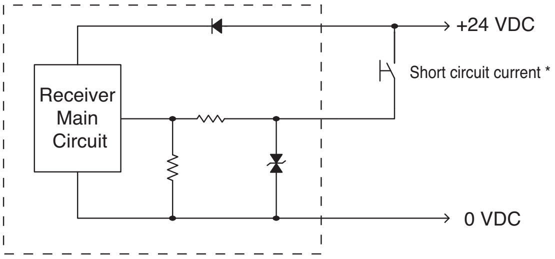
The input circuit diagrams of by function are shown below.

PNP Output

<Input circuit (Test input)>

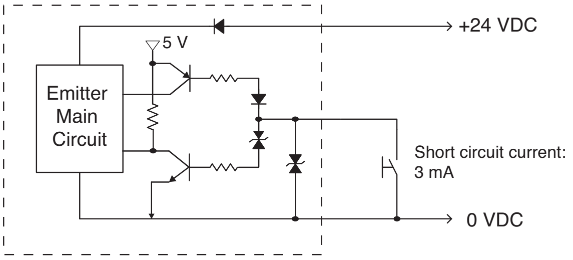

5 V
Emitter Main Circuit
+24 VDC
Short circuit current: 3 mA
0 VDC

<Input circuit (Reset input, Muting inputs A/B)>

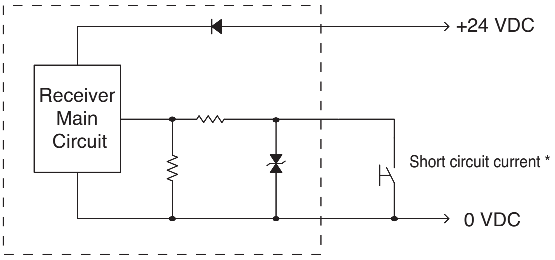

Receiver Main Circuit
+24 VDC
Short circuit current *
0 VDC

NPN Output

<Input circuit (Test input)>


5 V
Emitter Main Circuit
+24 VDC
Short circuit current: 3 mA
0 VDC

<Input circuit (Reset, Muting inputs A/B)>


Receiver Main Circuit
+24 VDC
Short circuit current *
0 VDC

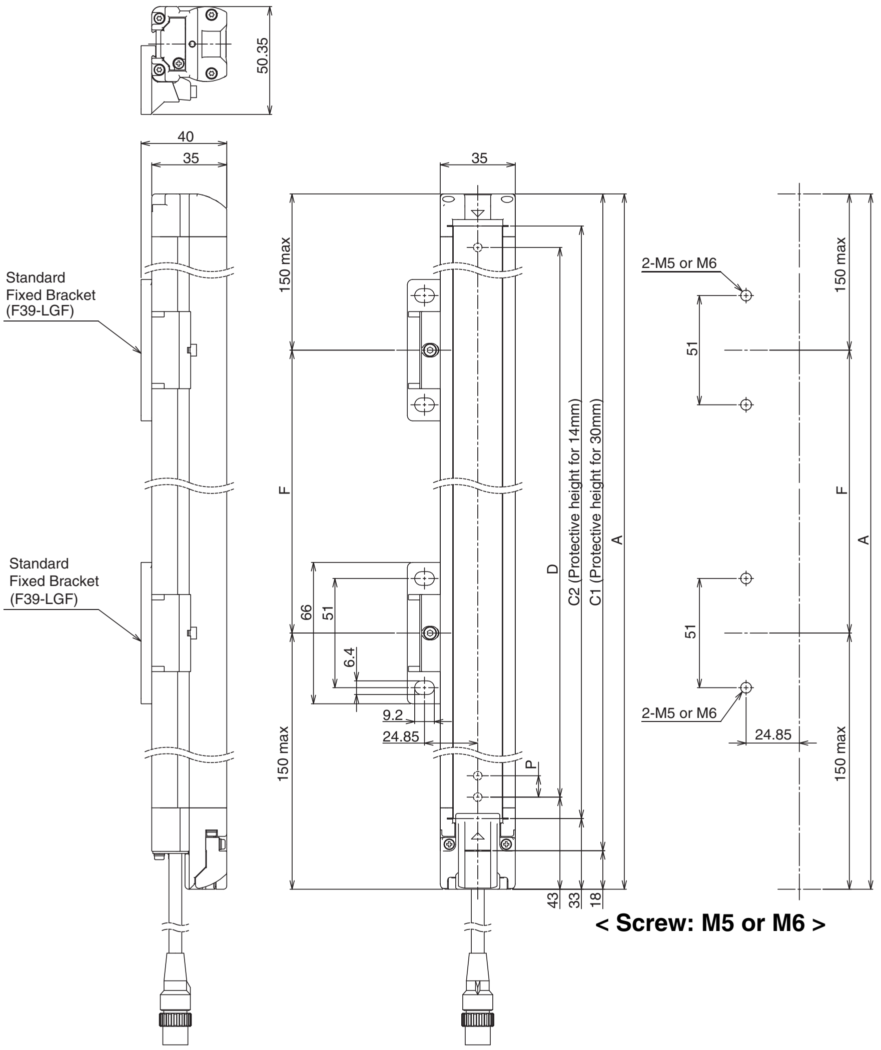
*Short circuit current: 5mA (Reset input), 3mA (Muting inputs A/B)

Dimensions

(Unit: mm)

Mounted with Standard Fixed Brackets (F39-LGF)

Backside Mounting


50.35
40
35
35
Standard Fixed Bracket (F39-LGF)
Standard Fixed Bracket (F39-LGF)
150 max
F
150 max
66
51
6.4
9.2
24.85
P
D
C2 (Protective height for 14mm)
C1 (Protective height for 30mm)
A
43
33
18
2-M5 or M6
51
F
51
2-M5 or M6
24.85
150 max
A
150 max

< Screw: M5 or M6 >

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

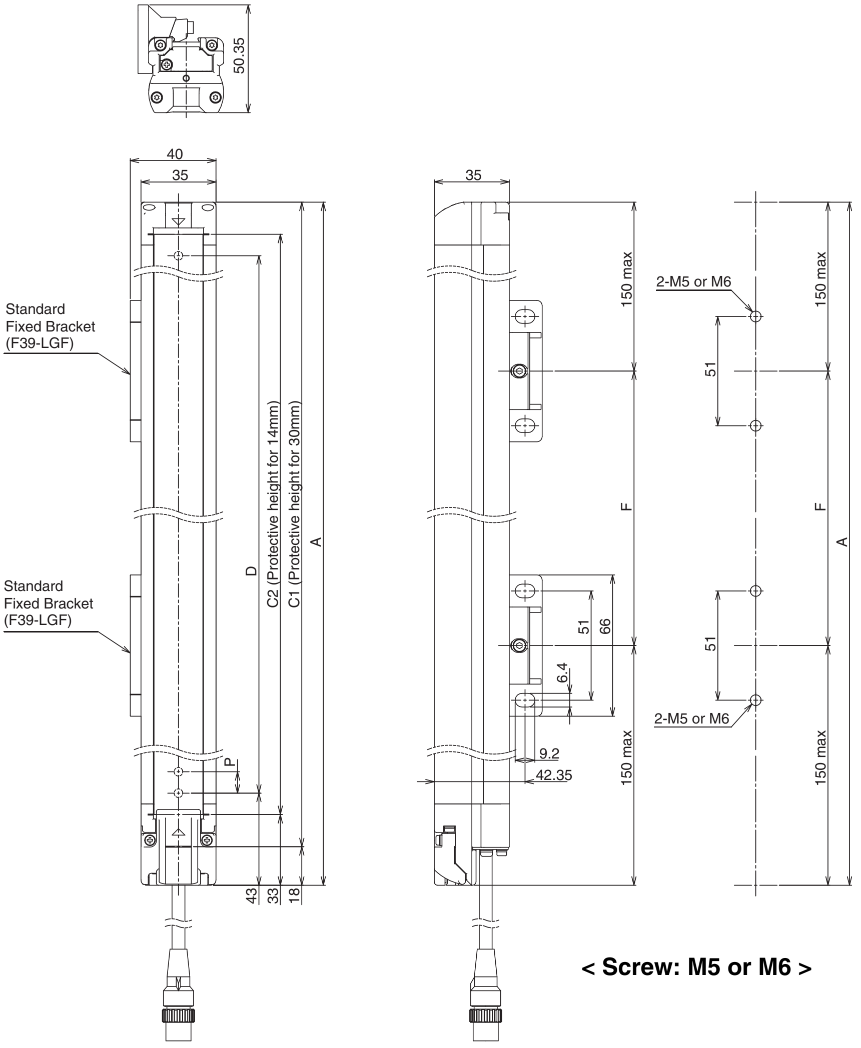
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Side Mounting


50.35
40
35
35
Standard
Fixed Bracket
(F39-LGF)
Standard
Fixed Bracket
(F39-LGF)
D
C2 (Protective height for 14mm)
C1 (Protective height for 30mm)
A
P
43
33
18
150 max
F
150 max
2-M5 or M6
51
51
66
6.4
9.2
42.35
2-M5 or M6
150 max
51
F
A
51
150 max
< Screw: M5 or M6 >

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

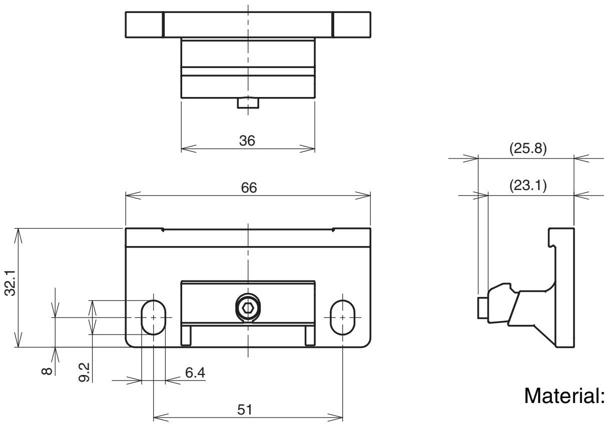
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	**2**	**1000 mm max.**
1310 to 2270	**3**	**1000 mm max.**
2350 to 2510	**4**	**1000 mm max.**

F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

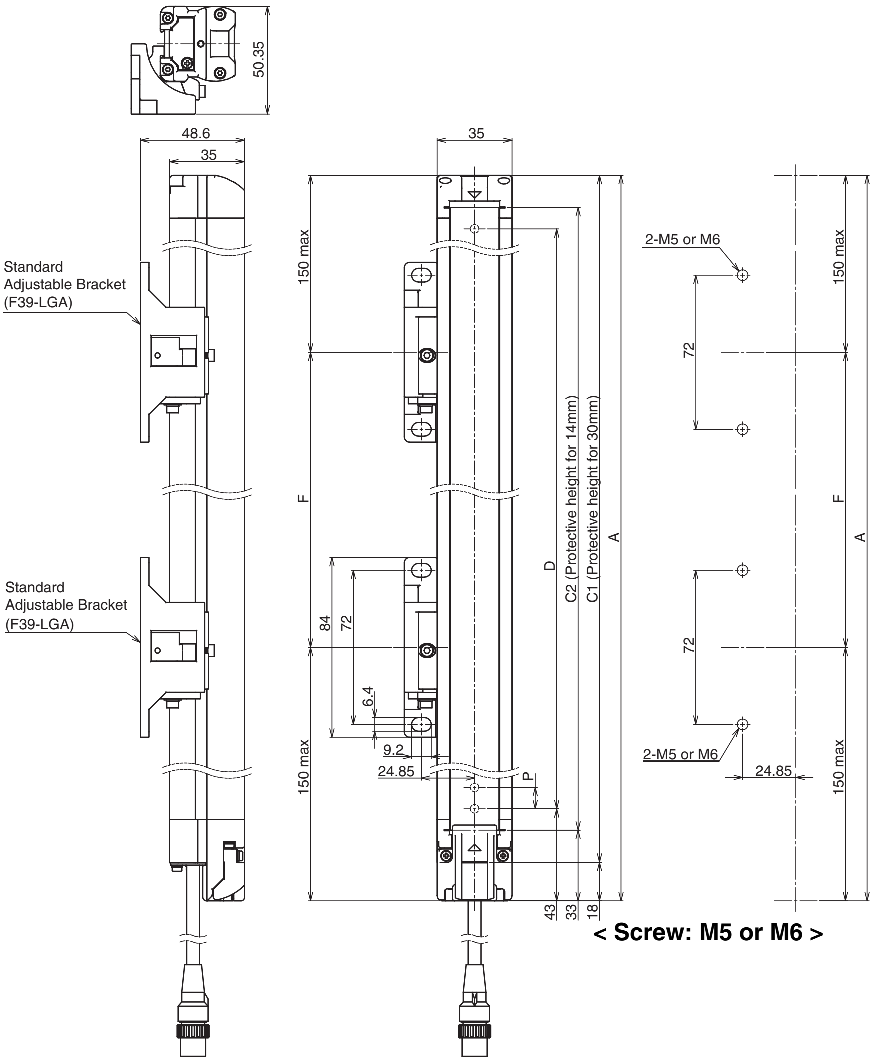
Standard Fixed Bracket (F39-LGF)


36
66
32.1
8
9.2
6.4
51
(25.8)
(23.1)

Material: ZDC2

Mounted with Standard Adjustable Brackets (F39-LGA)

Backside Mounting


50.35
48.6
35
35
Standard
Adjustable Bracket
(F39-LGA)
Standard
Adjustable Bracket
(F39-LGA)
150 max
F
84
72
6.4
9.2
24.85
150 max
D
C2 (Protective height for 14mm)
C1 (Protective height for 30mm)
A
P
43
33
18
2-M5 or M6
72
72
2-M5 or M6
24.85
150 max
F
A
150 max
< Screw: M5 or M6 >

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

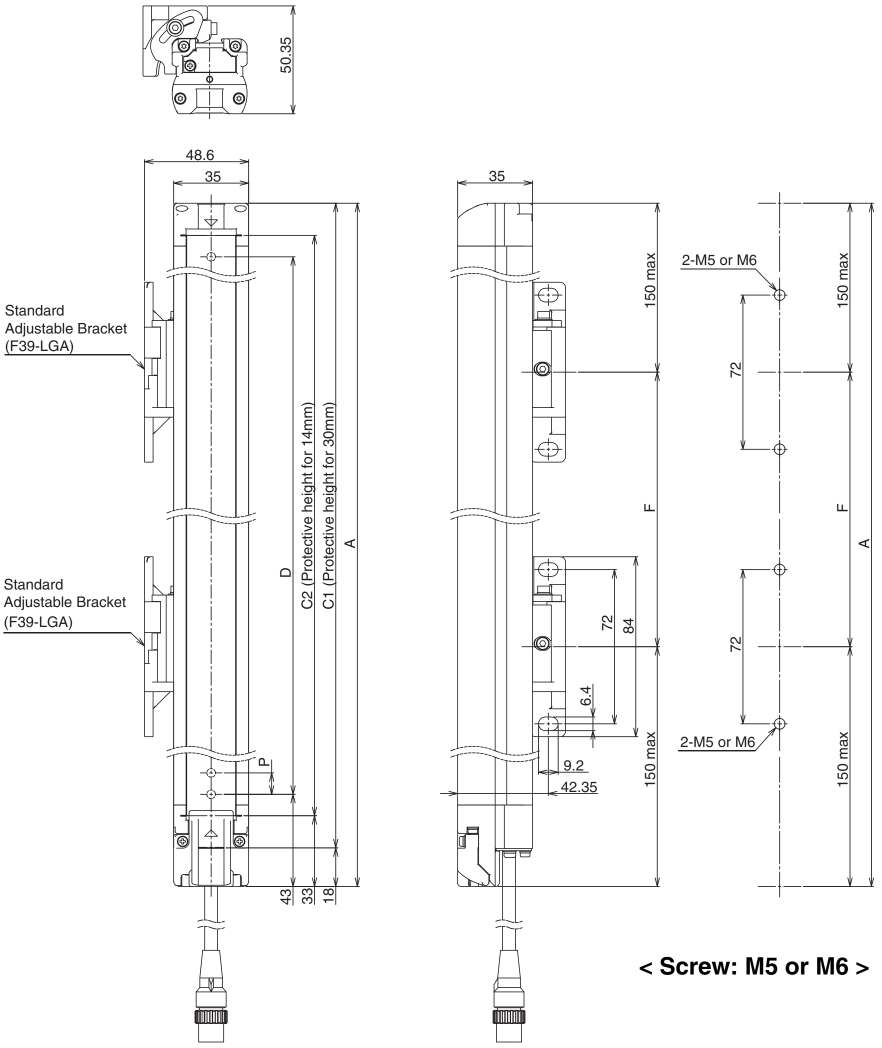
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

Protective height (C2)	Number of Standard Adjustable Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Side Mounting


50.35
48.6
35
Standard
Adjustable Bracket
(F39-LGA)
Standard
Adjustable Bracket
(F39-LGA)
D
C2 (Protective height for 14mm)
C1 (Protective height for 30mm)
A
P
43
33
18
35
150 max
F
150 max
72
84
6.4
9.2
42.35
2-M5 or M6
72
F
72
2-M5 or M6
150 max
A
150 max

< Screw: M5 or M6 >

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

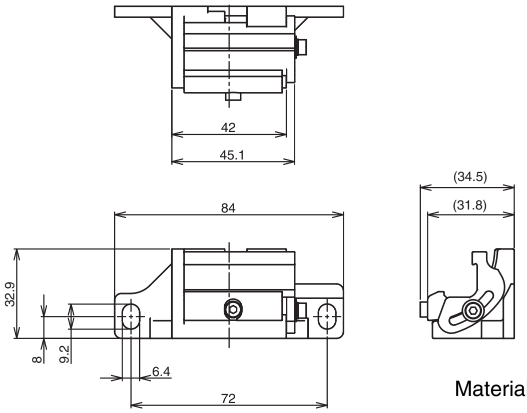
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Adjustable Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Standard Adjustable Bracket (F39-LGA)

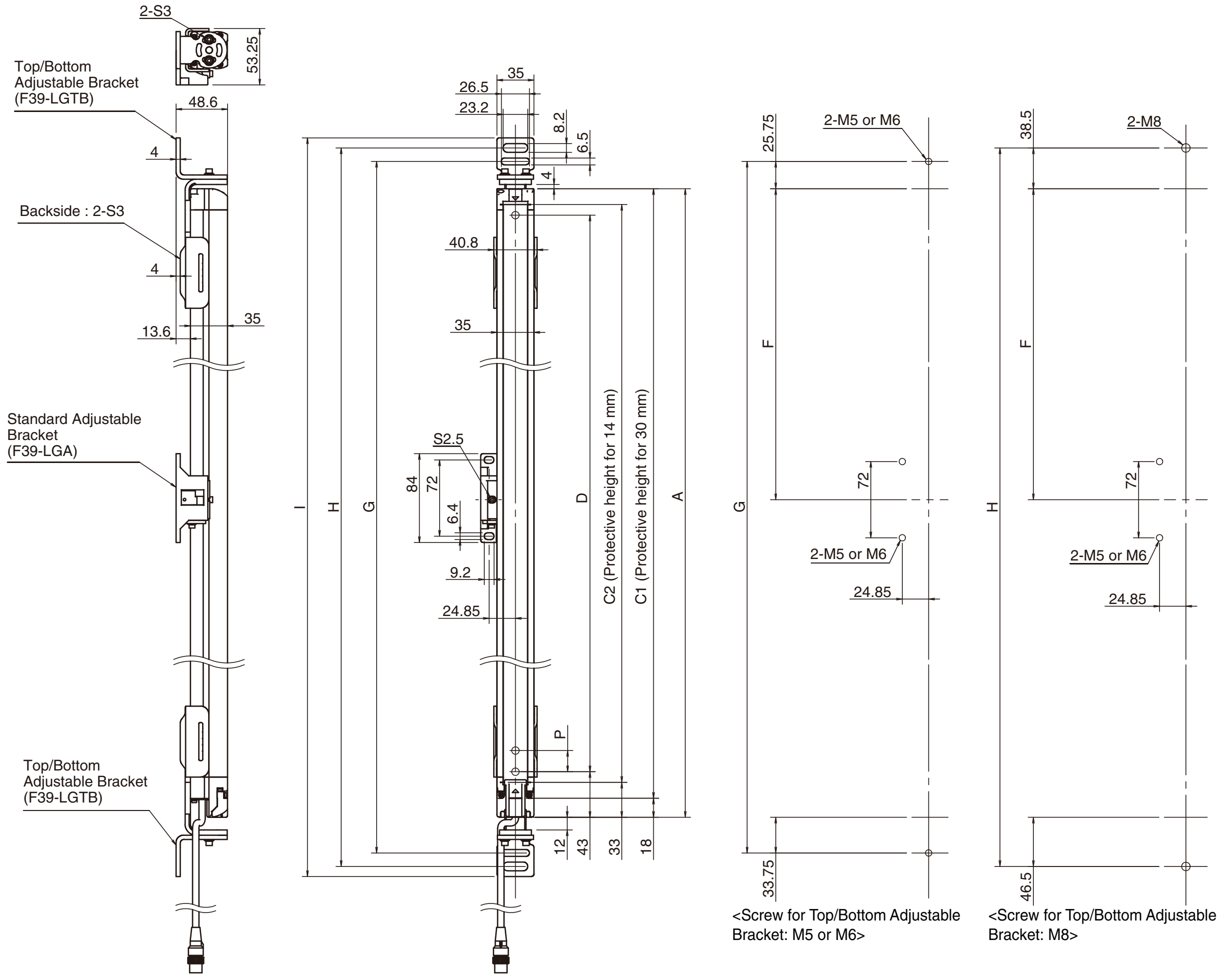

42
45.1
84
32.9
8
9.2
6.4
72
(34.5)
(31.8)

Material: ZDC2 ,Fluorochemical lubricant oil

Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and Standard Adjustable Brackets (F39-LGA)

Dimensions when using the F3SG-RA Series except the F3SG-4RA0190-30 and F3SG-4RA0160-14
Refer to *Safety Light Curtain F3SG-R Series User's Manual* for the dimensions when using the F3SG-4RA0190-30 and F3SG-4RA0160-14.

Backside Mounting


2-S3
53.25
Top/Bottom Adjustable Bracket (F39-LGTB)
48.6
4
Backside : 2-S3
4
13.6
35
Standard Adjustable Bracket (F39-LGA)
Top/Bottom Adjustable Bracket (F39-LGTB)
35
26.5
23.2
8.2
6.5
4
40.8
35
S2.5
84
72
6.4
9.2
24.85
I
H
G
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
12
43
33
18
25.75
2-M5 or M6
F
G
72
2-M5 or M6
24.85
33.75
38.5
2-M8
F
H
72
2-M5 or M6
24.85
46.5

<Screw for Top/Bottom Adjustable Bracket: M5 or M6>

<Screw for Top/Bottom Adjustable Bracket: M8>

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+77.5
Dimension H	C1+103
Dimension I	C1+122
Dimension P	20

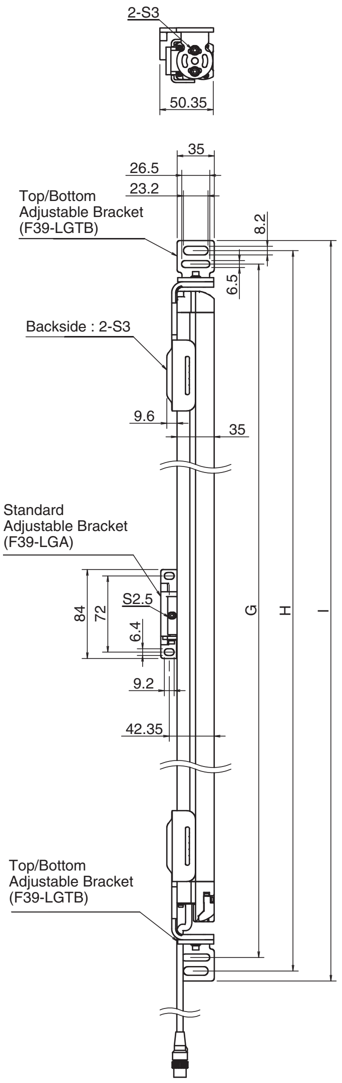
F3SG-□RA□□□□-14 Series

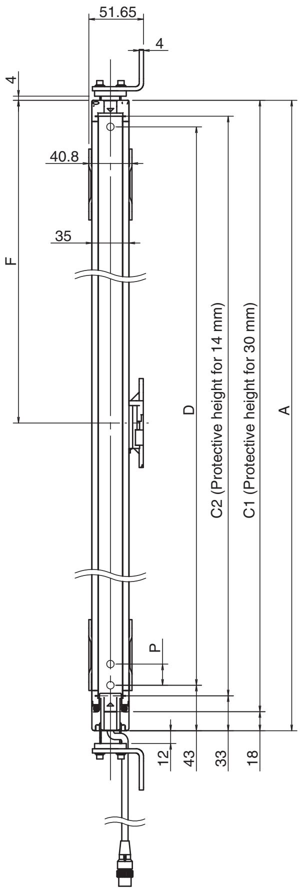
Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+107.5
Dimension H	C2+133
Dimension I	C2+152
Dimension P	10

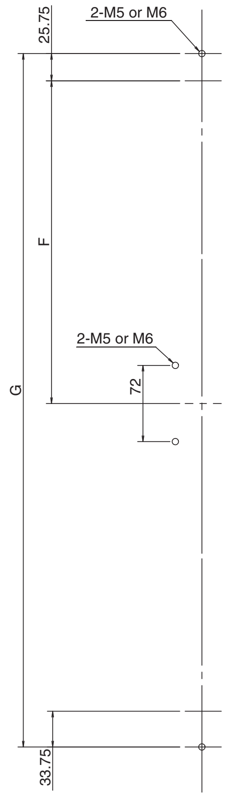
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0240 to 1040	2	0	–
1120 to 1920	2	1	1000 mm max.
2000 to 2080	2	2	1000 mm max.

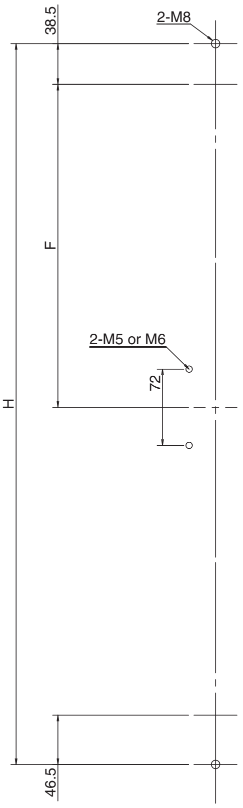
Side Mounting


2-S3
50.35
35
26.5
23.2
Top/Bottom
Adjustable Bracket
(F39-LGTB)
8.2
6.5
Backside : 2-S3
9.6
35
Standard
Adjustable Bracket
(F39-LGA)
84
72
S2.5
6.4
9.2
42.35
G
H
I
Top/Bottom
Adjustable Bracket
(F39-LGTB)


51.65
4
4
40.8
35
F
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
12
43
33
18


25.75
2-M5 or M6
F
G
2-M5 or M6
72
33.75

<Screw for Top/Bottom Adjustable Bracket: M5 or M6>


38.5
2-M8
F
H
2-M5 or M6
72
46.5

<Screw for Top/Bottom Adjustable Bracket: M8>

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+77.5
Dimension H	C1+103
Dimension I	C1+122
Dimension P	20

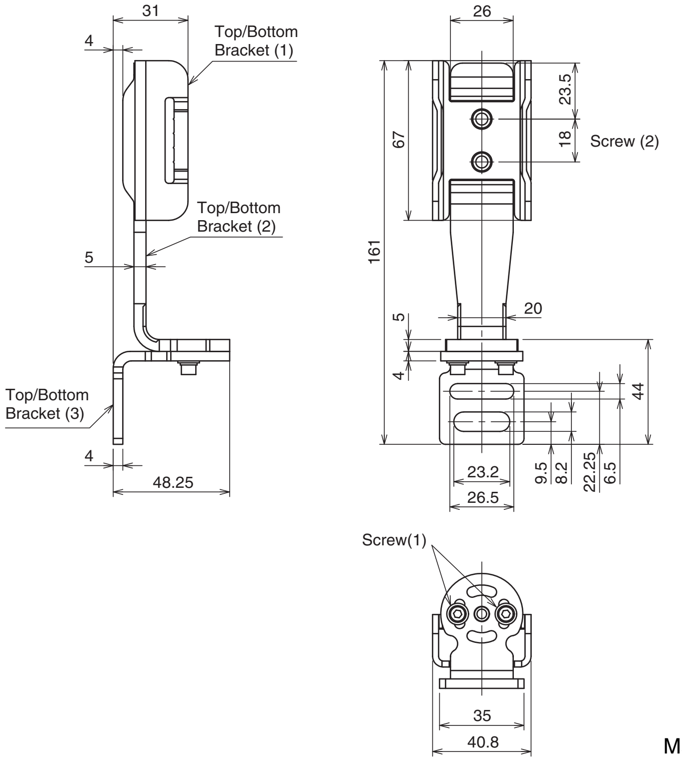
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+107.5
Dimension H	C2+133
Dimension I	C2+152
Dimension P	10

Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0240 to 1040	2	0	–
1120 to 1920	2	1	1000 mm max.
2000 to 2080	2	2	1000 mm max.

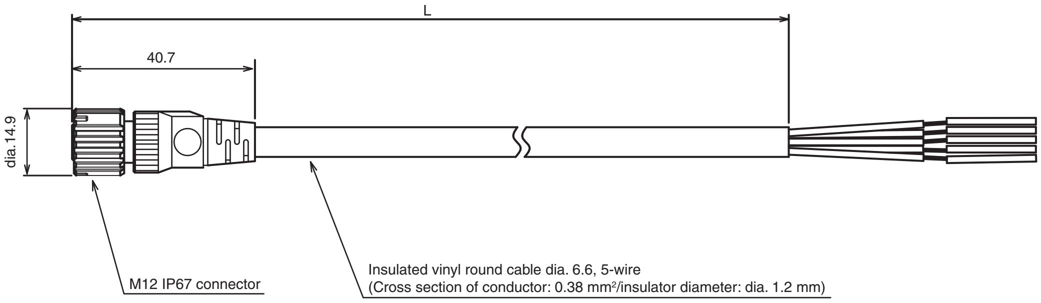
Top/Bottom Adjustable Bracket (F39-LGTB)


31
4
Top/Bottom Bracket (1)
Top/Bottom Bracket (2)
5
Top/Bottom Bracket (3)
4
48.25
26
23.5
18
Screw (2)
67
161
20
5
4
44
23.2
26.5
9.5
8.2
22.25
6.5
Screw(1)
35
40.8

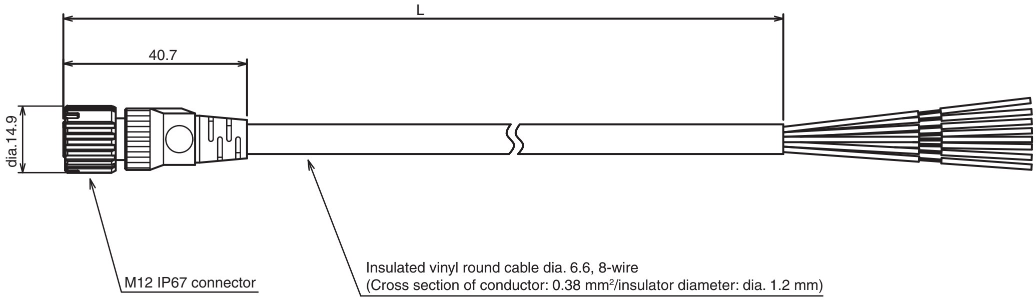
Material: SUS304

Accessories

Single-Ended Cable for Emitter (F39-JG☐A-L, sold separately)

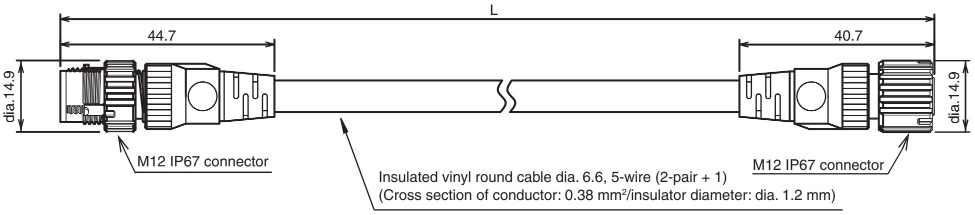

L
40.7
dia.14.9
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 5-wire
(Cross section of conductor: 0.38 mm²/insulator diameter: dia. 1.2 mm)

Single-Ended Cable for Receiver (F39-JG☐A-D, sold separately)

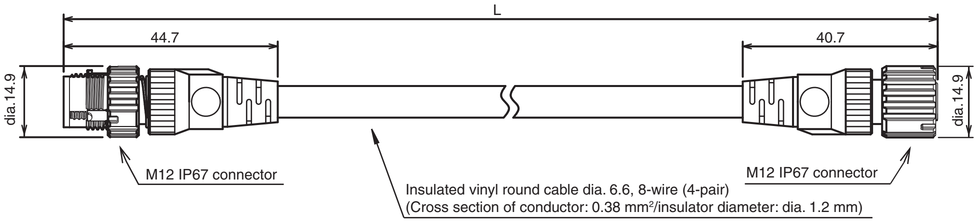

L
40.7
dia.14.9
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 8-wire
(Cross section of conductor: 0.38 mm²/insulator diameter: dia. 1.2 mm)

Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JG3A-L	**F39-JG3A-D**	3
F39-JG7A-L	**F39-JG7A-D**	7
F39-JG10A-L	**F39-JG10A-D**	10
F39-JG15A-L	**F39-JG15A-D**	15
F39-JG20A-L	**F39-JG20A-D**	20

Double-ended Cable for Emitter: Cable for extension (F39-JG□B-L, sold separately)

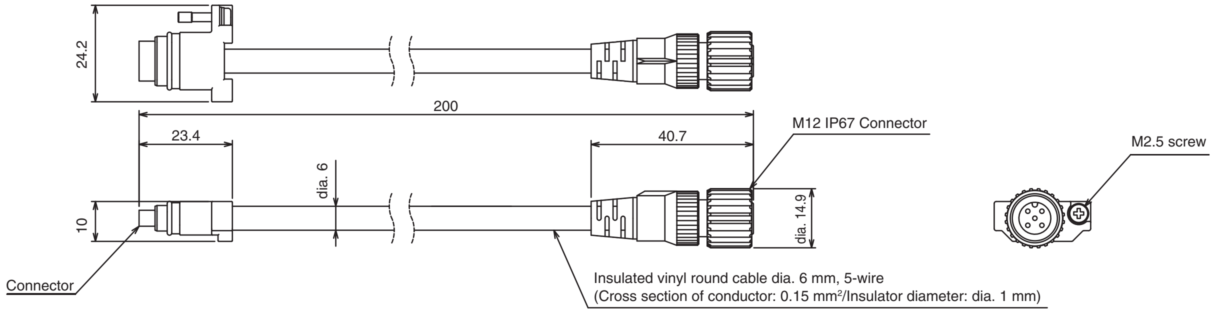

L
44.7
40.7
dia.14.9
dia.14.9
M12 IP67 connector
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 5-wire (2-pair + 1)
(Cross section of conductor: 0.38 mm²/insulator diameter: dia. 1.2 mm)

Double-Ended Cable for Receiver: Cable for extension (F39-JG□B-D, sold separately)

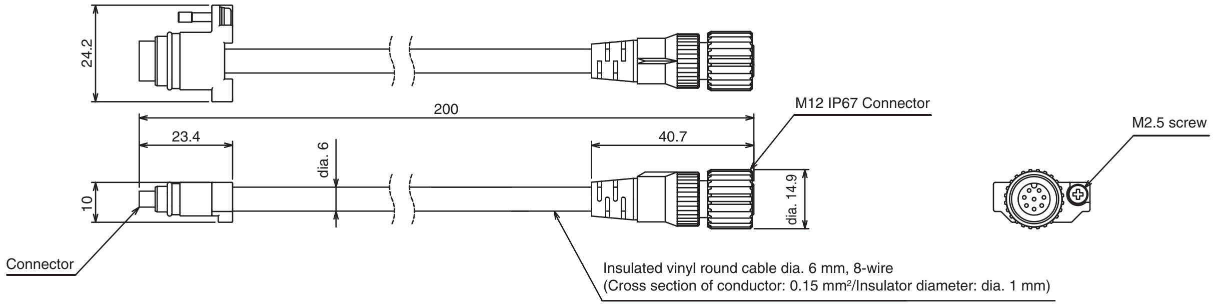

L
44.7
40.7
dia.14.9
dia.14.9
M12 IP67 connector
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 8-wire (4-pair)
(Cross section of conductor: 0.38 mm²/insulator diameter: dia. 1.2 mm)

Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	**F39-JGR15B-D**	0.5
F39-JG1B-L	**F39-JG1B-D**	1
F39-JG3B-L	**F39-JG3B-D**	3
F39-JG5B-L	**F39-JG5B-D**	5
F39-JG7B-L	**F39-JG7B-D**	7
F39-JG10B-L	**F39-JG10B-D**	10
F39-JG15B-L	**F39-JG15B-D**	15
F39-JG20B-L	**F39-JG20B-D**	20

Cascading Cable for Emitter (F39-JGR2W-L, sold separately)

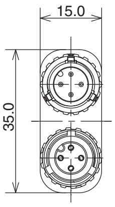

24.2
200
23.4
40.7
M12 IP67 Connector
M2.5 screw
dia. 6
10
dia. 14.9
Connector
Insulated vinyl round cable dia. 6 mm, 5-wire
(Cross section of conductor: 0.15 mm²/Insulator diameter: dia. 1 mm)

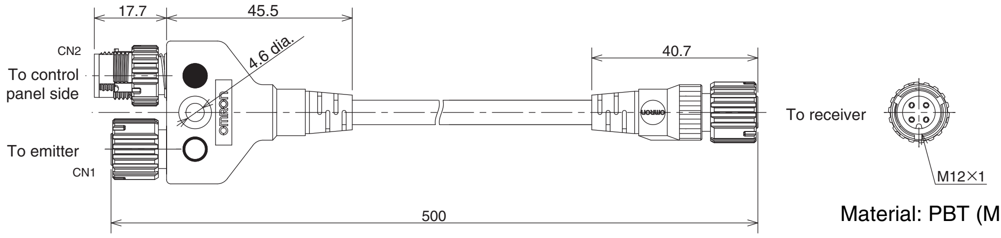
Cascading Cable for Receiver (F39-JGR2W-D, sold separately)


24.2
200
23.4
40.7
M12 IP67 Connector
M2.5 screw
dia. 6
10
dia. 14.9
Connector
Insulated vinyl round cable dia. 6 mm, 8-wire
(Cross section of conductor: 0.15 mm²/Insulator diameter: dia. 1 mm)

Y-Joint Plug/Socket Connector (F39-GCNY2, sold separately)

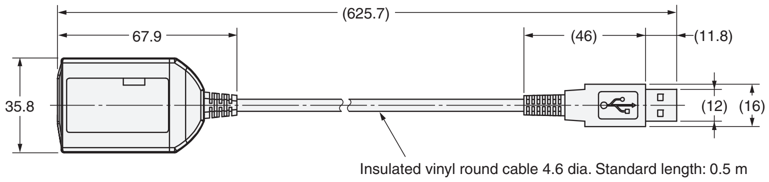
Plug marked with ● (bule circle): Connect to control panel side
Socket marked with ○ (white circle): Connect to emitter

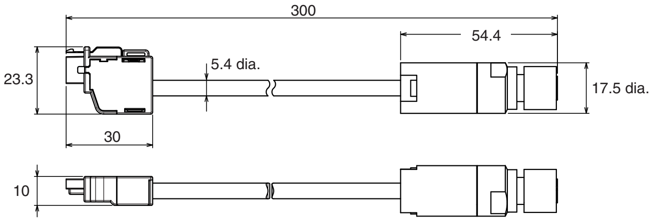


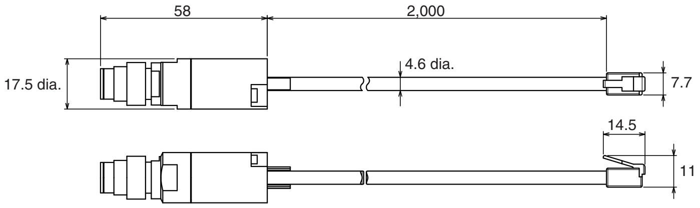

17.7
45.5
4.6 dia.
40.7
CN2
To control panel side
To emitter
CN1
To receiver
M12×1
500

Material: PBT (Main body)

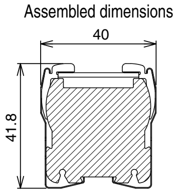
Interface Unit (F39-GIF)


(625.7)
67.9
(46)
(11.8)
35.8
(12)
(16)
Insulated vinyl round cable 4.6 dia. Standard length: 0.5 m


300
54.4
5.4 dia.
23.3
17.5 dia.
30
10


58
2,000
4.6 dia.
17.5 dia.
7.7
14.5
11

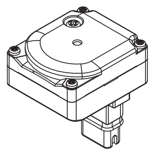
Spatter Protection Cover (F39-HGA)

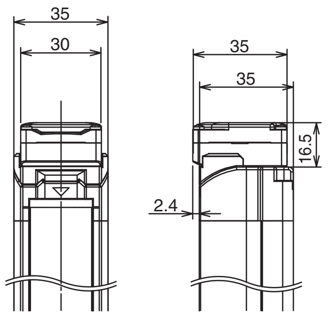

Assembled dimensions
40
41.8

Model	Total length
F39-HGA□□□□	□□□□+4
F39-HGA0550	558

Material: PC (Transparent cover)
ABS (Side wall)
Stainless steel (Bracket)
Aluminum adhesive tape
(Fixing sticker)

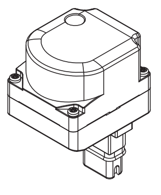
Bluetooth unit (F39-BT)

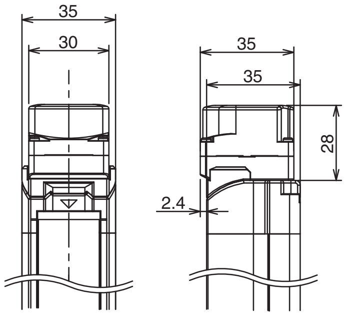



35
30
35
35
16.5
2.4

Material: PBT

Bluetooth + Lamp unit (F39-BTLP) Lamp (F39-LP)




35
30
35
35
28
2.4

Material:
PC (Lighting element)
PBT (Other body parts)

Related Manuals

ManNo.	Model	Manual name
Z352	**F3SG-□R□□□□□□□□**	Safety Light Curtain F3SG-□R Series User's Manual

Safety Light Curtain Easy type
F3SG-RE

Easy-to-use Safety Sensor Ideal for Simple On/Off Detection Applications

- Provides simple safety functions - saving TCO by reducing errors
- Simple wiring with only 4 wires
- Fast response time of 5 ms

Ordering Information

Main Units

Safety Light Curtain

Finger protection

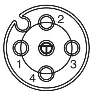
Number of beams	Protective height (mm)	Model	
		PNP output	NPN output
15	160	F3SG-4RE0160P14	F3SG-4RE0160N14
23	240	F3SG-4RE0240P14	F3SG-4RE0240N14
31	320	F3SG-4RE0320P14	F3SG-4RE0320N14
39	400	F3SG-4RE0400P14	F3SG-4RE0400N14
47	480	F3SG-4RE0480P14	F3SG-4RE0480N14
55	560	F3SG-4RE0560P14	F3SG-4RE0560N14
63	640	F3SG-4RE0640P14	F3SG-4RE0640N14
71	720	F3SG-4RE0720P14	F3SG-4RE0720N14
79	800	F3SG-4RE0800P14	F3SG-4RE0800N14
87	880	F3SG-4RE0880P14	F3SG-4RE0880N14
95	960	F3SG-4RE0960P14	F3SG-4RE0960N14
103	1,040	F3SG-4RE1040P14	F3SG-4RE1040N14
111	1,120	F3SG-4RE1120P14	F3SG-4RE1120N14
119	1,200	F3SG-4RE1200P14	F3SG-4RE1200N14
127	1,280	F3SG-4RE1280P14	F3SG-4RE1280N14
135	1,360	F3SG-4RE1360P14	F3SG-4RE1360N14
143	1,440	F3SG-4RE1440P14	F3SG-4RE1440N14
151	1,520	F3SG-4RE1520P14	F3SG-4RE1520N14
159	1,600	F3SG-4RE1600P14	F3SG-4RE1600N14
167	1,680	F3SG-4RE1680P14	F3SG-4RE1680N14
175	1,760	F3SG-4RE1760P14	F3SG-4RE1760N14
183	1,840	F3SG-4RE1840P14	F3SG-4RE1840N14
191	1,920	F3SG-4RE1920P14	F3SG-4RE1920N14
199	2,000	F3SG-4RE2000P14	F3SG-4RE2000N14
207	2,080	F3SG-4RE2080P14	F3SG-4RE2080N14

Hand and arm protection

Number of beams	Protective height (mm)	Model	
		PNP	NPN
8	190	**F3SG-4RE0190P30**	**F3SG-4RE0190N30**
12	270	**F3SG-4RE0270P30**	**F3SG-4RE0270N30**
16	350	**F3SG-4RE0350P30**	**F3SG-4RE0350N30**
20	430	**F3SG-4RE0430P30**	**F3SG-4RE0430N30**
24	510	**F3SG-4RE0510P30**	**F3SG-4RE0510N30**
28	590	**F3SG-4RE0590P30**	**F3SG-4RE0590N30**
32	670	**F3SG-4RE0670P30**	**F3SG-4RE0670N30**
36	750	**F3SG-4RE0750P30**	**F3SG-4RE0750N30**
40	830	**F3SG-4RE0830P30**	**F3SG-4RE0830N30**
44	910	**F3SG-4RE0910P30**	**F3SG-4RE0910N30**
48	990	**F3SG-4RE0990P30**	**F3SG-4RE0990N30**
52	1,070	**F3SG-4RE1070P30**	**F3SG-4RE1070N30**
56	1,150	**F3SG-4RE1150P30**	**F3SG-4RE1150N30**
60	1,230	**F3SG-4RE1230P30**	**F3SG-4RE1230N30**
64	1,310	**F3SG-4RE1310P30**	**F3SG-4RE1310N30**
68	1,390	**F3SG-4RE1390P30**	**F3SG-4RE1390N30**
72	1,470	**F3SG-4RE1470P30**	**F3SG-4RE1470N30**
76	1,550	**F3SG-4RE1550P30**	**F3SG-4RE1550N30**
80	1,630	**F3SG-4RE1630P30**	**F3SG-4RE1630N30**
84	1,710	**F3SG-4RE1710P30**	**F3SG-4RE1710N30**
88	1,790	**F3SG-4RE1790P30**	**F3SG-4RE1790N30**
92	1,870	**F3SG-4RE1870P30**	**F3SG-4RE1870N30**
96	1,950	**F3SG-4RE1950P30**	**F3SG-4RE1950N30**
100	2,030	**F3SG-4RE2030P30**	**F3SG-4RE2030N30**
104	2,110	**F3SG-4RE2110P30**	**F3SG-4RE2110N30**
108	2,190	**F3SG-4RE2190P30**	**F3SG-4RE2190N30**
112	2,270	**F3SG-4RE2270P30**	**F3SG-4RE2270N30**
116	2,350	**F3SG-4RE2350P30**	**F3SG-4RE2350N30**
120	2,430	**F3SG-4RE2430P30**	**F3SG-4RE2430N30**
124	2,510	**F3SG-4RE2510P30**	**F3SG-4RE2510N30**

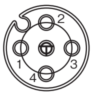
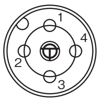
Accessories (Sold separately)

Single-ended Connector Cable (Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End)

Appearance	Type	Cable length	Specifications	Model
	M12 connector (4-pin), 4 wires	1 m	 Female	**XS5F-D421-C80-F**
		2 m		**XS5F-D421-D80-F**
		3 m		**XS5F-D421-E80-F**
		5 m		**XS5F-D421-G80-F**
		10 m		**XS5F-D421-J80-F**
		20 m		**XS5F-D421-L80-F**

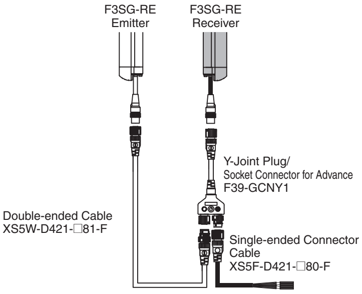
PIN	Emitter	Recelver	Color
1	+24 VDC	+24 VDC	Brown
2	Range setting	OSSD 2	White
3	0 VDC	0 VDC	Blue
4	Not used	OSSD 1	Black

Double-ended Cable (Round Water-resistant Connector: Connectors Connected to Cable, Socket and Plug on Cable Ends) For cable extension and simple wiring

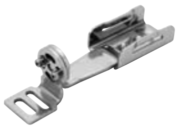
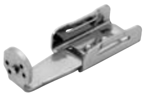
Appearance	Type	Cable length	Specifications	Model
	M12 connector (4-pin) on both ends	1 m	 Female  Male	**XS5W-D421-C81-F**
		2 m		**XS5W-D421-D81-F**
		3 m		**XS5W-D421-E81-F**
		5 m		**XS5W-D421-G81-F**
		10 m		**XS5W-D421-J81-F**
		20 m		**XS5W-D421-L81-F**

1	Brown	1	Brown
2	White	2	White
3	Blue	3	Blue
4	Black	4	Black

Y-Joint Plug/Socket Connector for Easy type F3SG-RE

Appearance	Type	Cable length	Specifications	Model
	M12 connectors. Used for reduced wiring.	0.5 m	 When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.	**F39-GCNY1**

Sensor Mounting Brackets

Appearance	Specification	Application	Model
	Standard Fixed Bracket	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package. See *1 below for the number of included brackets.)	**F39-LGF**
	Standard Adjustable Bracket	Bracket to mount the F3SG-R. Beam alignment after mounting possible.The angle adjustment range is ±15°. Side mounting and backside mounting possible. (Sold separately. See *1 below for the number of required brackets.)	**F39-LGA**
	Top/Bottom Adjustable Bracket *2	Bracket to mount the F3SG-R. Use this bracket at the top and bottom positions of the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is ±22.5°. Side mounting and backside mounting possible. (Sold separately. 4 brackets per set.)	**F39-LGTB**
	Top/Bottom Adjustable Bracket *2 (For user-made mounting part)	Top/Bottom Adjustable Bracket without a bracket to mount to the wall. Use the user's own wall mounting part to suit the machine. (Sold separately. 4 brackets per set.)	**F39-LGTB-1**

*1 Two brackets per set
[for F3SG-□RE□□□□□14] Protective height of 0160 to 1200: 2 sets, Protective height of 1280 to 2080: 3 sets
[for F3SG-□RE□□□□□30] Protective height of 0190 to 1230: 2 sets, Protective height of 1310 to 2270: 3 sets, Protective height of 2350 to 2510: 4 sets

*2 Top/Bottom Adjustable Bracket cannot be used with the Standard Fixed Bracket. Use with the Standard Adjustable Bracket.
(See *1 for the number of required brackets.)

Laser Pointer for F3SG-R

Appearance	Specifications	Model
	The laser pointer is attached on the optical surface of the F3SG to help coarse adjustment of beams.	**F39-PTG**

Spatter Protection Cover (Two covers per set, for emitter and receiver)

Spatter Protection Covers include mounting brackets.
For Safety Light Curtain models of the protective height of 2,000 mm or longer, use two Spatter Protection Covers of different lengths.

Appearance	Safety Light Curtain Model		Model
	Finger protection	Hand and arm protection	
	F3SG-□RE0160□14	F3SG-□RE0190□30	F39-HGB0180
	F3SG-□RE0240□14	F3SG-□RE0270□30	F39-HGB0260
	F3SG-□RE0320□14	F3SG-□RE0350□30	F39-HGB0340
	F3SG-□RE0400□14	F3SG-□RE0430□30	F39-HGB0420
	F3SG-□RE0480□14	F3SG-□RE0510□30	F39-HGB0500
	F3SG-□RE0560□14	F3SG-□RE0590□30	F39-HGB0580
	F3SG-□RE0640□14	F3SG-□RE0670□30	F39-HGB0660
	F3SG-□RE0720□14	F3SG-□RE0750□30	F39-HGB0740
	F3SG-□RE0800□14	F3SG-□RE0830□30	F39-HGB0820
	F3SG-□RE0880□14	F3SG-□RE0910□30	F39-HGB0900
	F3SG-□RE0960□14	F3SG-□RE0990□30	F39-HGB0980
	F3SG-□RE1040□14	F3SG-□RE1070□30	F39-HGB1060
	F3SG-□RE1120□14	F3SG-□RE1150□30	F39-HGB1140
	F3SG-□RE1200□14	F3SG-□RE1230□30	F39-HGB1220
	F3SG-□RE1280□14	F3SG-□RE1310□30	F39-HGB1300
	F3SG-□RE1360□14	F3SG-□RE1390□30	F39-HGB1380
	F3SG-□RE1440□14	F3SG-□RE1470□30	F39-HGB1460
	F3SG-□RE1520□14	F3SG-□RE1550□30	F39-HGB1540
	F3SG-□RE1600□14	F3SG-□RE1630□30	F39-HGB1620
	F3SG-□RE1680□14	F3SG-□RE1710□30	F39-HGB1700
	F3SG-□RE1760□14	F3SG-□RE1790□30	F39-HGB1780
	F3SG-□RE1840□14	F3SG-□RE1870□30	F39-HGB1860
	F3SG-□RE1920□14	F3SG-□RE1950□30	F39-HGB1940
	F3SG-□RE2000□14	F3SG-□RE2030□30	F39-HGB1460
			F39-HGA0550
	F3SG-□RE2080□14	F3SG-□RE2110□30	F39-HGB1540
			F39-HGA0550
	–	F3SG-□RE2190□30	F39-HGB1620
			F39-HGA0550
	–	F3SG-□RE2270□30	F39-HGB1700
			F39-HGA0550
	–	F3SG-□RE2350□30	F39-HGB1780
			F39-HGA0550
	–	F3SG-□RE2430□30	F39-HGB1860
			F39-HGA0550
	–	F3SG-□RE2510□30	F39-HGB1940
			F39-HGA0550

Note: The operating range of the Safety Light Curtain attached with the product is 10% shorter than the rating.

Test Rod

Diameter	Model
14 mm dia.	**F39-TRD14**
30 mm dia.	**F39-TRD30**

Ratings/Specifications

Main unit

			F3SG-4RE□□□□-14, F3SG-2RE□□□□-14	F3SG-4RE□□□□-30, F3SG-2RE□□□□-30
Perfor-mance	Type of ESPE (IEC 61496-1)	Type 4	F3SG-4RE□□□□□14/30	
		Type 2	F3SG-2RE□□□□□14/30	
	Object Resolution (Detection Capability)		Opaque objects	
			14-mm dia.	30-mm dia.
	Beam Gap		10mm	20mm
	Number of Beams		15 to 207	8 to 124
	Lens Size		5.2 ×3.4 (W×H) mm	7-mm dia.
	Protective Height		160 to 2080 mm (6.3 to81.9 inch)	190 to 2510 mm (7.3 to98.7 inch)
	Operating Range	Long	0.3 to 10.0 m (1 to 32 ft.)	0.3 to 20.0 m (1 to 65 ft.)
		Short	0.3 to 3.0 m (1 to 10 ft.)	0.3 to 7.0 m (1 to 23 ft.)
	Response Time	ON to OFF	5 to 15ms *1	
		OFF to ON	25 to 75ms *1	
		*1.Response time when used in one segment system or in cascaded connection Refer to page 50 .		
	Effective Aperture Angle (EAA) (IEC61496-2)	Type 4	±2.5° max., emitter and receiver at operating range of 3 m or greater	
		Type 2	±5.0° max., emitter and receiver at operating range of 3 m or greater	
	Light Source		Infrared LEDs, Wavelength: 870 nm	
	Startup Waiting Time		2 s max.	

			F3SG-4RE□□□□-14, F3SG-2RE□□□□-14	F3SG-4RE□□□□-30, F3SG-2RE□□□□-30
Electricall	**Power Supply Voltage (Vs)**		SELV/PELV 24 VDC±20% (ripple p-p 10% max.)	
	Current Consumption		📖 Refer to page 50	
	Safety Outputs (OSSD)		F3SG-□RE□□□□P□□: Two PNP transistor outputs F3SG-□RE□□□□N□□: Two NPN transistor outputs	
			Load current of 300 mA max., Residual voltage of 2 V max. (except for voltage drop due to cable extension), Capacitive load of 1 μF max., Inductive load of 2.2 H max. *1 Leakage current of 1 mA max. (PNP), 2 mA max. (NPN) *2 *1. The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger. *2. These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor.	
	Output Operation Mode	**Safety Output**	Light-ON (Safety output is enabled when the receiver receives an emitting signal.)	
	Input Voltage	**ON Voltage**	Operating Range Select Input: Long: 9 V to Vs (sink current 3 mA max.) * Short: 0 to 3 V (source current 3 mA max.)	
		OFF Voltage		
		*The Vs indicates a supply voltage value in your environment.		
	Overvoltage Category (IEC60664-1)		II	
	Indicators		📖 Refer to page 51	
	Protective Circuit		Output short protection, Power supply reverse polarity protection	
	Insulation Resistance		20 MΩ or higher (500 VDC megger)	
	Dielectric Strength		1,000 VAC, 50/60 Hz (1 min)	
Functional	**Test Function**		Self-test (at power-on, and during operation)	
Environ-mental	**Ambient Temperature**	**Operating**	-10 to 55°C (14 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	**Operating**	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance		Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of Protection (IEC 60529)		IP65 and IP67	
	Vibration Resistance (IEC 61496-1)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
	Shock Resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes	
	Pollution Degree (IEC 60664-1)		Pollution Degree 3	
Connec-tions	**Power cable**	**Type of Connection**	M12 connectors: 4-pin, IP67 rated when mated,Cables prewired to the sensors	
		Number of Wires	Emitter: 4, Receiver: 4	
		Cable Length	0.3 m	
		Cable Diameter	6 mm	
		Minimum Bend-ing Radius	R5 mm	
	Extension cable - Single-ended cable - Double-ended cable	**Type of Connection**	Use the XS5□-D42□ series cables.	
		Number of Wires		
		Cable Length		
		Cable Diameter		
		Minimum Bend-ing Radius		
	Extension of Power Cable		100 m max.	
Material	**Material**		Housing: Aluminum Cap: PBT Front window: PMMA Cable: Oil resistant PVC Mounting Bracket: ZDC2 FE plate: SUS	
	Weight (packaged)		📖 Refer to page 50.	
	Included Accessories		Safety Precautions, Quick Installation Manual, Standard Fixed Bracket*1, Troubleshooting Guide Sticker *1. The quantity of Standard Fixed Brackets included varies depending on the protective height. [F3SG-□RE□□□□□14] - Protective height of 0160 to 1200: 2 sets - Protective height of 1280 to 2080: 3 sets [F3SG-□RE□□□□□30] - Protective height of 0190 to 1230: 2 sets - Protective height of 1310 to 2270: 3 sets - Protective height of 2350 to 2510: 4 sets	
Conformity	**Conforming standards**		📖 Refer to page 19	
	Performance Level (PL)/Safety category	**Type 4**	PL e/Category 4 (EN ISO 13849-1:2008)	
		Type 2	PL c/Category 2 (EN ISO 13849-1:2008)	
	PFHd		9.1 × 10^{-9} (IEC 61508)	
	Proof test interval TM		Every 20 years (IEC 61508)	
	SFF		99% (IEC 61508)	
	HFT		1 (IEC 61508)	
	Classification		Type B (IEC 61508-2)	

F3SG-RE

List of Models/Response Time/Current Consumption/Weight

F3SG-□RE□□□□□-14

Model	Number of Beams	Protective Height [mm]	Response Time[ms]			Current Consumption[mA]		Weight [kg] *
			ON→OFF	OFF (Synchronized) →ON	OFF (Not synchronized) →ON	Emitter	Receiver	
F3SG-□RE0160□14	15	160	5	25	125	45	50	1.7
F3SG-□RE0240□14	23	240	5	25	125	55	55	1.9
F3SG-□RE0320□14	31	320	7	35	135	55	55	2.1
F3SG-□RE0400□14	39	400	7	35	135	65	60	2.6
F3SG-□RE0480□14	47	480	7	35	135	70	60	2.8
F3SG-□RE0560□14	55	560	7	35	135	80	60	3.1
F3SG-□RE0640□14	63	640	7	35	135	85	65	3.3
F3SG-□RE0720□14	71	720	9	45	145	80	65	3.8
F3SG-□RE0800□14	79	800	9	45	145	85	70	4.0
F3SG-□RE0880□14	87	880	9	45	145	90	70	4.2
F3SG-□RE0960□14	95	960	9	45	145	95	75	4.4
F3SG-□RE1040□14	103	1040	9	45	145	100	75	4.6
F3SG-□RE1120□14	111	1120	11	55	155	90	75	4.7
F3SG-□RE1200□14	119	1200	11	55	155	95	80	4.9
F3SG-□RE1280□14	127	1280	11	55	155	100	80	5.1
F3SG-□RE1360□14	135	1360	11	55	155	105	85	5.6
F3SG-□RE1440□14	143	1440	11	55	155	110	85	5.7
F3SG-□RE1520□14	151	1520	13	65	165	100	90	5.9
F3SG-□RE1600□14	159	1600	13	65	165	105	90	6.5
F3SG-□RE1680□14	167	1680	13	65	165	110	95	6.7
F3SG-□RE1760□14	175	1760	13	65	165	115	95	6.9
F3SG-□RE1840□14	183	1840	13	65	165	115	95	7.1
F3SG-□RE1920□14	191	1920	15	75	175	110	100	7.3
F3SG-□RE2000□14	199	2000	15	75	175	115	100	7.4
F3SG-□RE2080□14	207	2080	15	75	175	115	105	8.0

* The weight includes an emitter, a receiver and included brackets in a product package.

F3SG-□RE□□□□□30

Model	Number of Beams	Protective Height [mm]	Response Time[ms]			Current Consumption[mA]		Weight [kg] *
			ON→OFF	OFF (Synchronized) →ON	OFF (Not synchronized) →ON	Emitter	Receiver	
F3SG-□RE0190□30	8	190	5	25	125	40	50	1.7
F3SG-□RE0270□30	12	270	5	25	125	45	50	1.9
F3SG-□RE0350□30	16	350	5	25	125	50	50	2.1
F3SG-□RE0430□30	20	430	5	25	125	55	55	2.6
F3SG-□RE0510□30	24	510	5	25	125	60	55	2.8
F3SG-□RE0590□30	28	590	7	35	135	50	55	3.0
F3SG-□RE0670□30	32	670	7	35	135	55	55	3.2
F3SG-□RE0750□30	36	750	7	35	135	60	60	3.8
F3SG-□RE0830□30	40	830	7	35	135	65	60	4.0
F3SG-□RE0910□30	44	910	7	35	135	65	60	4.2
F3SG-□RE0990□30	48	990	7	35	135	70	60	4.4
F3SG-□RE1070□30	52	1070	7	35	135	75	60	4.5
F3SG-□RE1150□30	56	1150	7	35	135	80	65	4.7
F3SG-□RE1230□30	60	1230	7	35	135	85	65	4.9
F3SG-□RE1310□30	64	1310	7	35	135	85	65	5.1
F3SG-□RE1390□30	68	1390	9	45	145	75	65	5.5
F3SG-□RE1470□30	72	1470	9	45	145	80	65	5.7
F3SG-□RE1550□30	76	1550	9	45	145	80	70	5.9
F3SG-□RE1630□30	80	1630	9	45	145	85	70	6.4
F3SG-□RE1710□30	84	1710	9	45	145	85	70	6.6
F3SG-□RE1790□30	88	1790	9	45	145	90	70	6.8
F3SG-□RE1870□30	92	1870	9	45	145	95	75	7.0
F3SG-□RE1950□30	96	1950	9	45	145	95	75	7.2
F3SG-□RE2030□30	100	2030	9	45	145	100	75	7.3
F3SG-□RE2110□30	104	2110	9	45	145	100	75	7.9
F3SG-□RE2190□30	108	2190	11	55	155	90	75	8.1
F3SG-□RE2270□30	112	2270	11	55	155	95	80	8.2
F3SG-□RE2350□30	116	2350	11	55	155	95	80	8.7
F3SG-□RE2430□30	120	2430	11	55	155	95	80	8.8
F3SG-□RE2510□30	124	2510	11	55	155	100	80	9.0

* The weight includes an emitter, a receiver and included brackets in a product package.

LED Indicator Status

Emitter

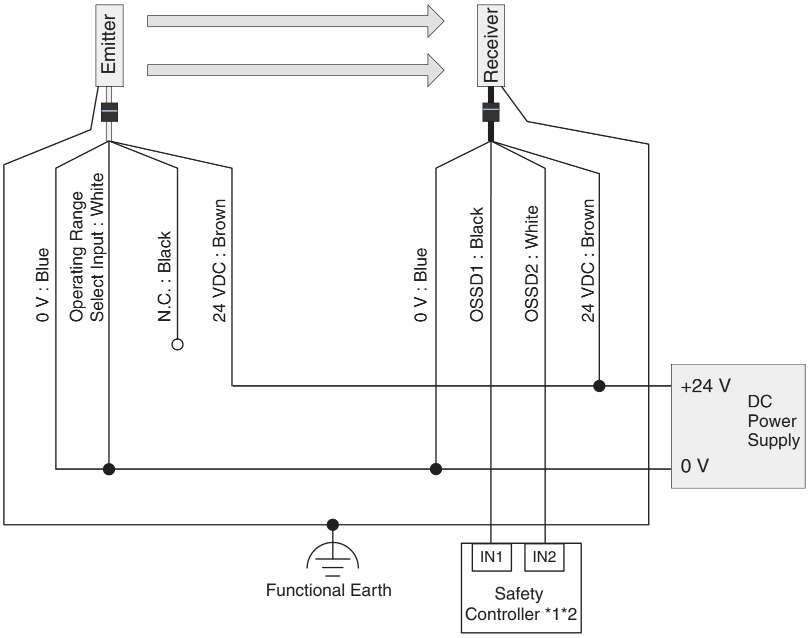
Name of Indicator		Color	Illuminated	Blinking
Operating range	LONG	Green	Long range mode is selected	Lockout state due to Operating range selection setting error
Power	POWER	Green	Power is ON.	Error due to noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in emitter

Receiver

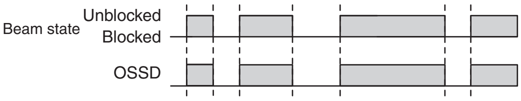
Name of Indicator		Color	Illuminated	Blinking
Top-beam-state	TOP	Blue	The top beam is unblocked	–
Internal error	INTERNAL	Red	–	Lockout state due to Internal error, or error due to abnormal power supply or noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in receiver
Stable-state	STB	Green	Incident light level is 170% or higher of ON threshold	Safety output is instantaneously turned OFF due to ambient light or vibration
ON/OFF	ON/OFF	Green	Safety output is in ON state	–
		Red	Safety output is in OFF state	Lockout state due to Safety Output error, or error due to abnormal power supply or noise
Communication	COM	Green	Synchronization between emitter and receiver is maintained	Lockout state due to Communication error, or error due to abnormal power supply or noise
Bottom-beam-state	BTM	Blue	The bottom beam is unblocked	–

Connections (Basic Wiring Diagram)

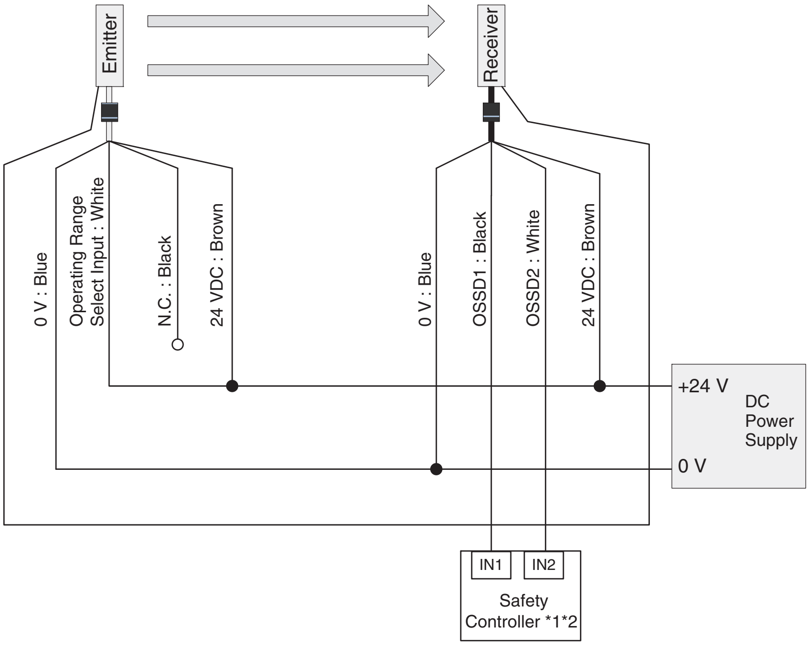
Short Mode


Emitter
Receiver
0 V : Blue
Operating Range Select Input : White
N.C. : Black
24 VDC : Brown
0 V : Blue
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
+24 V
DC Power Supply
0 V
Functional Earth
IN1
IN2
Safety Controller *1*2

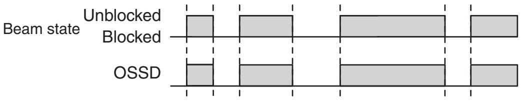
*1.Refer to page 49 for more information.
*2.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.



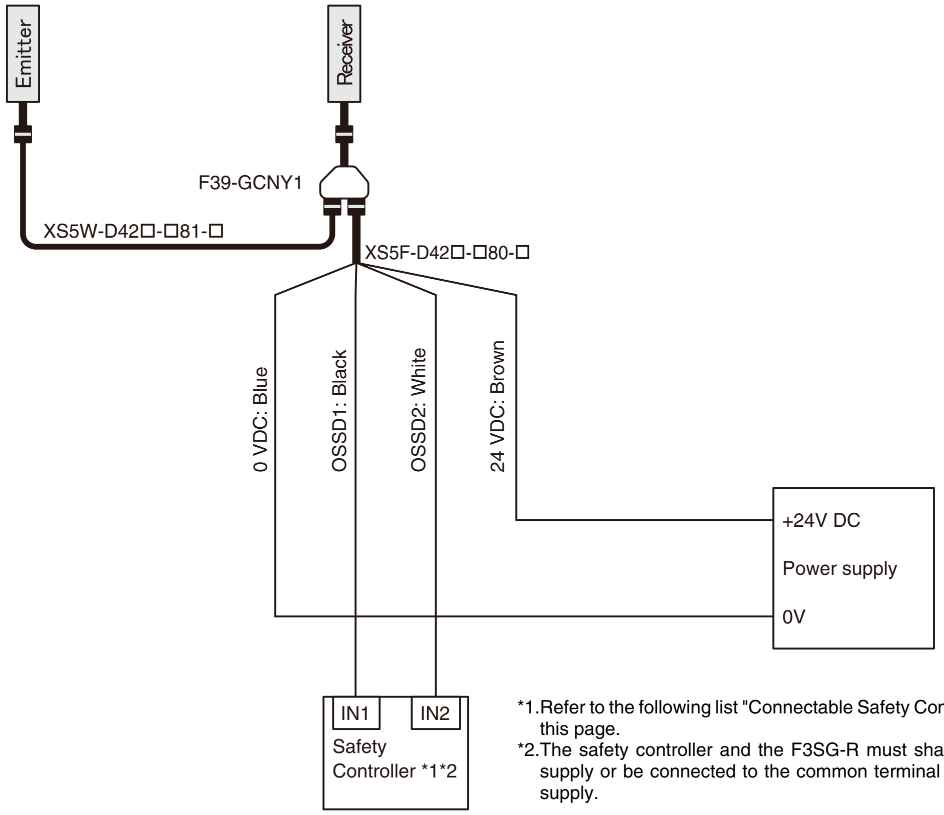
Long Mode


Emitter
Receiver
0 V : Blue
Operating Range Select Input : White
N.C. : Black
24 VDC : Brown
0 V : Blue
OSSD1 : Black
OSSD2 : White
24 VDC : Brown
+24 V
DC Power Supply
0 V
IN1
IN2
Safety Controller *1*2

*1.Refer to page 49 for more information.
*2.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.

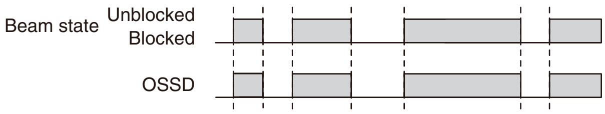


Standalone F3SG-RE with Y-Joint Plug/Socket Connector


Emitter
Receiver
F39-GCNY1
XS5W-D42□-□81-□
XS5F-D42□-□80-□
0 VDC: Blue
OSSD1: Black
OSSD2: White
24 VDC: Brown
+24V DC
Power supply
0V
IN1
IN2
Safety
Controller *1*2

*1. Refer to the following list "Connectable Safety Control Units" on this page.

*2. The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.



Note: When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.

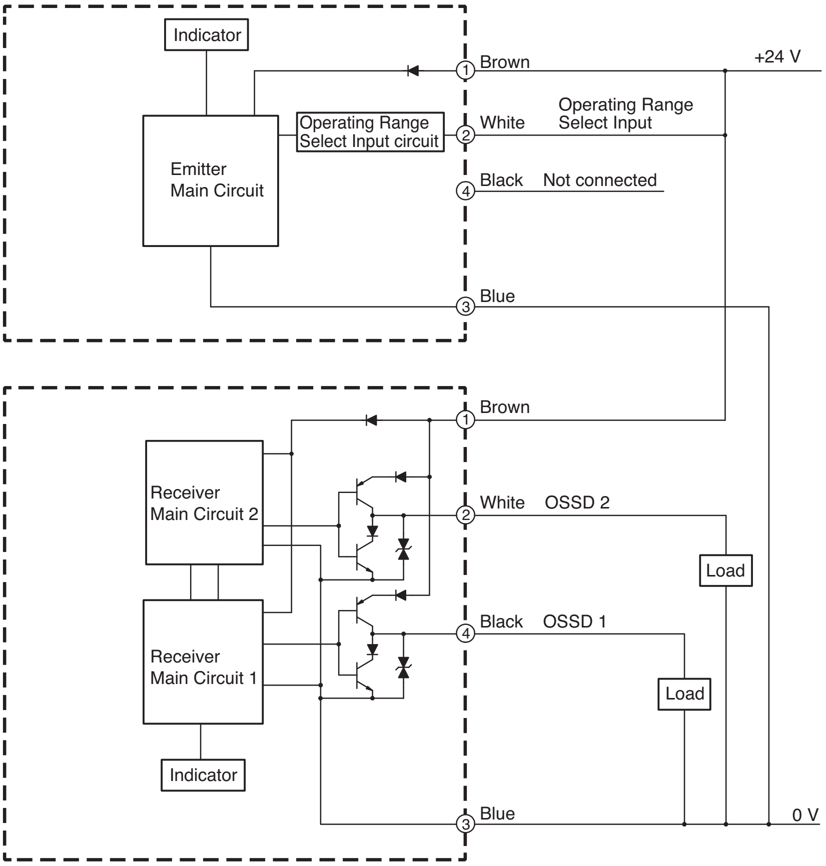
Connectable Safety Control Units

The F3SG-RE with PNP output can be connected to the safety control units listed in the table below.

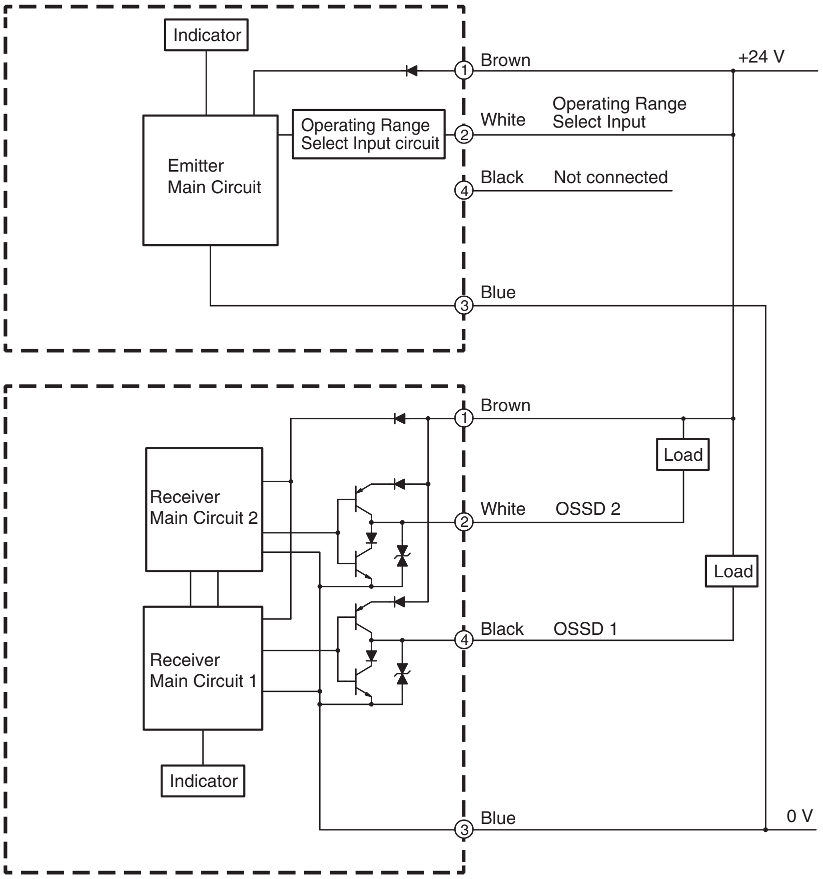
Connectable Safety Control Units (PNP output)		
G9SA-301 **G9SA-321** **G9SA-501** **G9SB-200-B** **G9SB-200-D** **G9SB-301-B** **G9SB-301-D** **G9SE-201** **G9SE-401** **G9SE-221-T□**	**G9SX-AD322-T** **G9SX-ADA222-T** **G9SX-BC202** **G9SX-GS226-T15**	**G9SP-N10S** **G9SP-N10D** **G9SP-N20S** **NE0A-SCPU01** **NE1A-SCPU01** **NE1A-SCPU02** **DST1-ID12SL-1** **DST1-MD16SL-1** **DST1-MRD08SL-1** **NX-SIH400** **NX-SID800** **F3SP-T01**

Input/Output Circuit

PNP Output


Indicator
Emitter Main Circuit
Operating Range Select Input circuit
① Brown
+24 V
② White
Operating Range Select Input
④ Black
Not connected
③ Blue
Receiver Main Circuit 2
Receiver Main Circuit 1
Indicator
① Brown
② White
OSSD 2
Load
④ Black
OSSD 1
Load
③ Blue
0 V

NPN Output

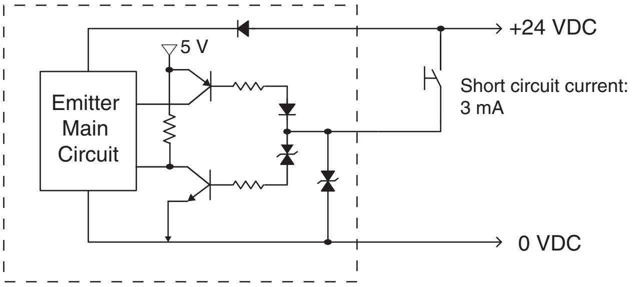

Indicator
Emitter Main Circuit
Operating Range Select Input circuit
① Brown
+24 V
② White
Operating Range Select Input
④ Black
Not connected
③ Blue
Receiver Main Circuit 2
Receiver Main Circuit 1
Indicator
① Brown
Load
② White
OSSD 2
Load
④ Black
OSSD 1
③ Blue
0 V

Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

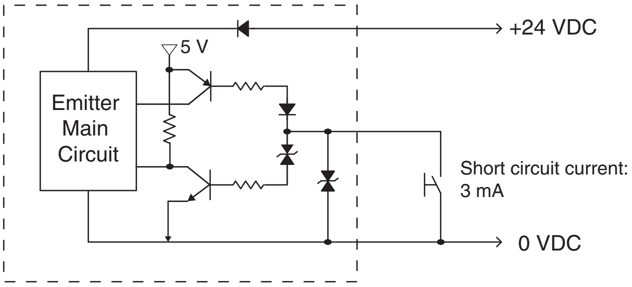
PNP Output

<Input circuit (Operating Range Select Input)>


+24 VDC
5 V
Emitter Main Circuit
Short circuit current: 3 mA
0 VDC

NPN Output

<Input circuit (Operating Range Select Input)>

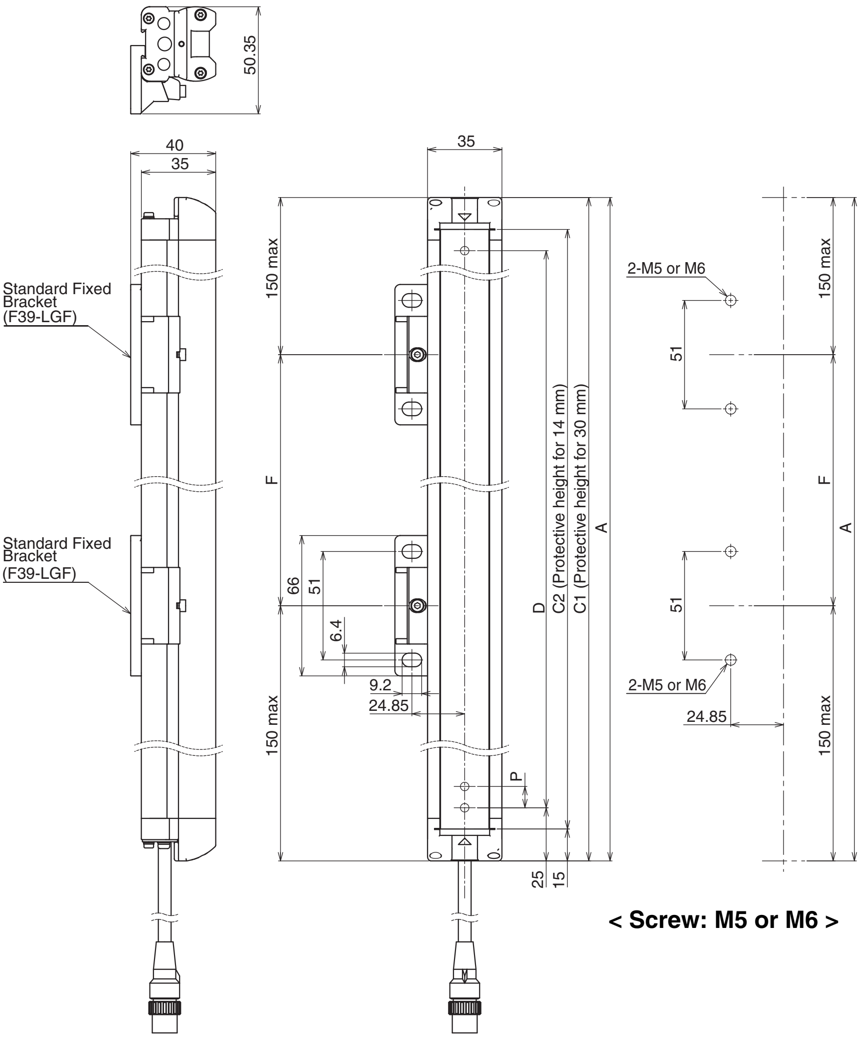

+24 VDC
5 V
Emitter Main Circuit
Short circuit current: 3 mA
0 VDC

Dimensions

(Unit: mm)

Mounted with Standard Fixed Brackets (F39-LGF)

Backside Mounting


50.35
40
35
35
Standard Fixed Bracket (F39-LGF)
Standard Fixed Bracket (F39-LGF)
150 max
F
66
51
6.4
9.2
24.85
150 max
P
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
25
15
2-M5 or M6
51
51
2-M5 or M6
24.85
150 max
F
A
150 max

< Screw: M5 or M6 >

F3SG-4RE□□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name(Protective height)
Dimension D	C1-50
Dimension P	20

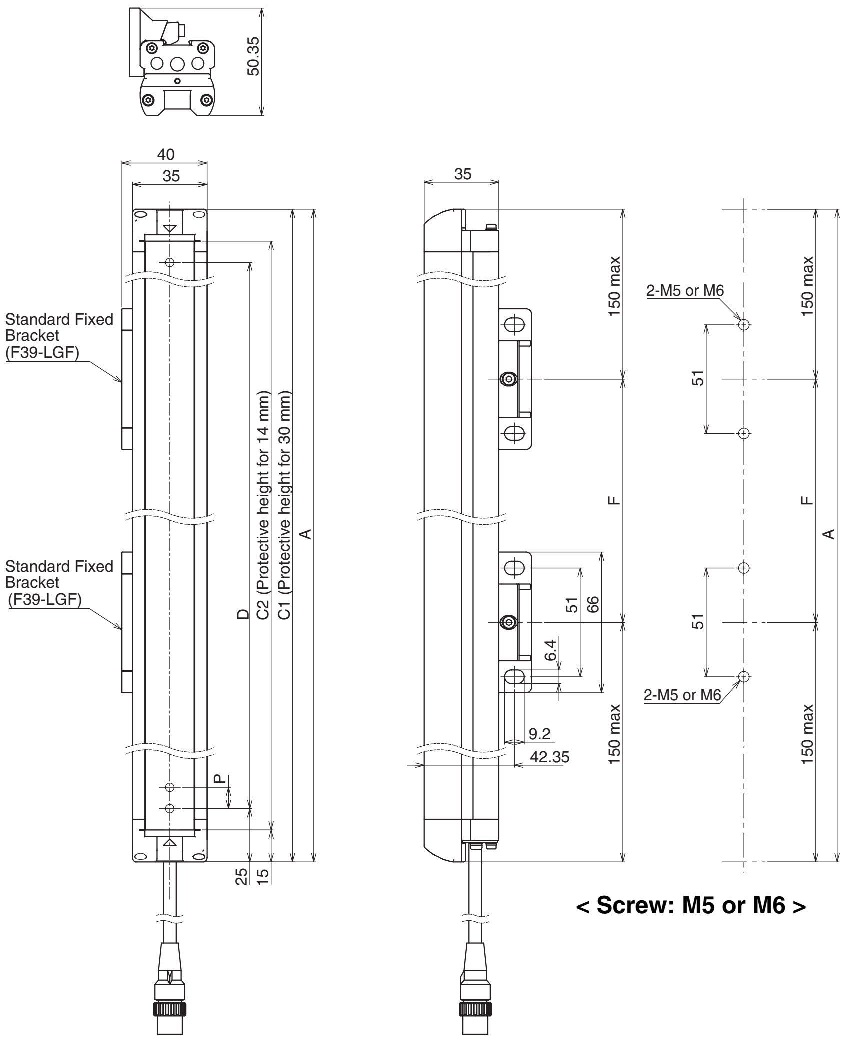
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name(Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Side Mounting


50.35
40
35
35
Standard Fixed Bracket (F39-LGF)
Standard Fixed Bracket (F39-LGF)
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
25
15
150 max
F
150 max
51
66
6.4
9.2
42.35
2-M5 or M6
51
F
A
51
2-M5 or M6
150 max
150 max
< Screw: M5 or M6 >

F3SG-4RE□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

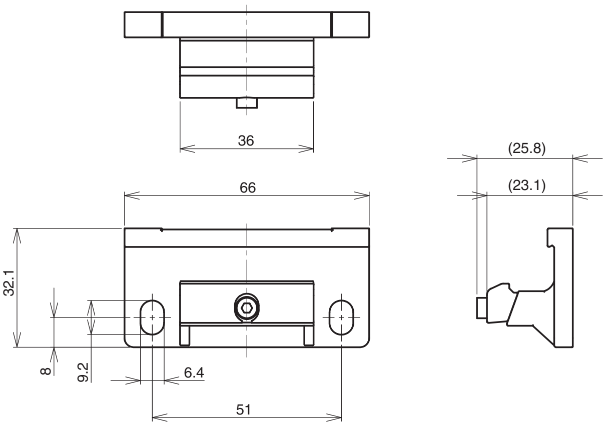
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

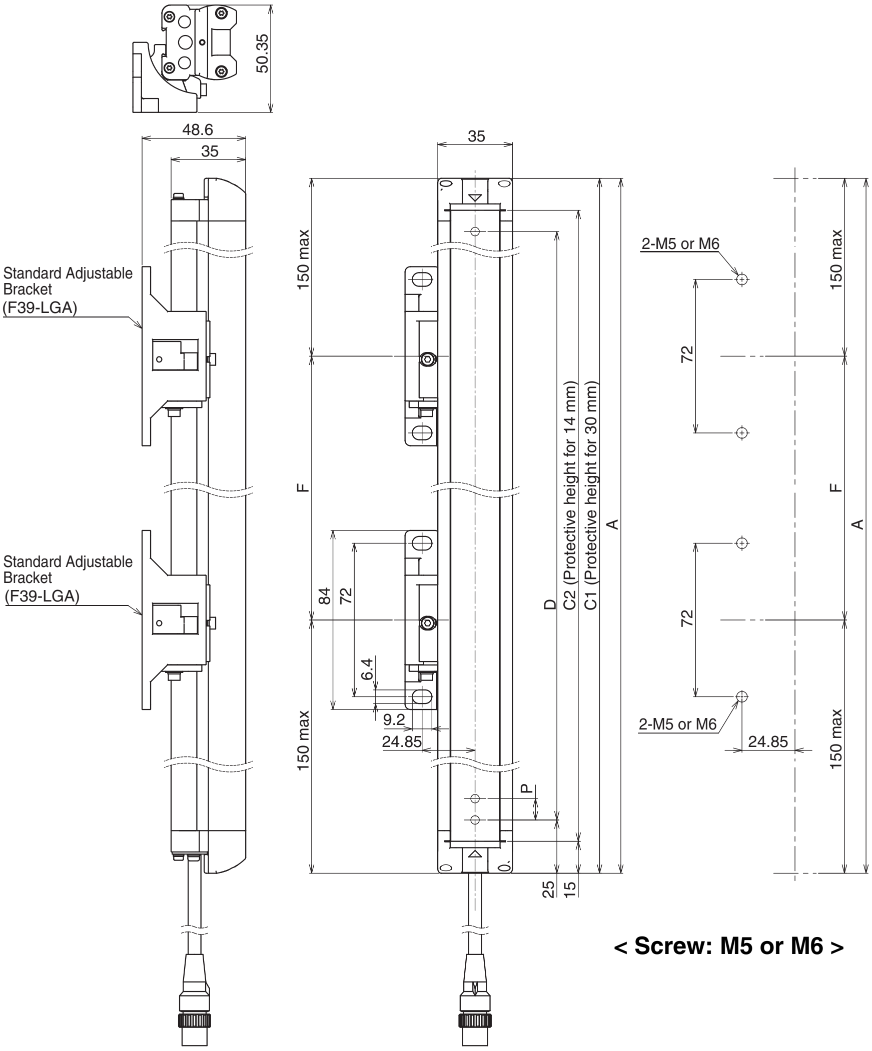
Standard Fixed Bracket(F39-LGF)


36
66
32.1
8
9.2
6.4
51
(25.8)
(23.1)

Material: ZDC2

Mounted with Standard Fixed Brackets (F39-LGA)

Backside Mounting


50.35
48.6
35
Standard Adjustable Bracket (F39-LGA)
Standard Adjustable Bracket (F39-LGA)
35
150 max
F
84
72
6.4
9.2
24.85
150 max
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
25
15
2-M5 or M6
72
72
2-M5 or M6
24.85
150 max
F
A
150 max
< Screw: M5 or M6 >

F3SG-4RE□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

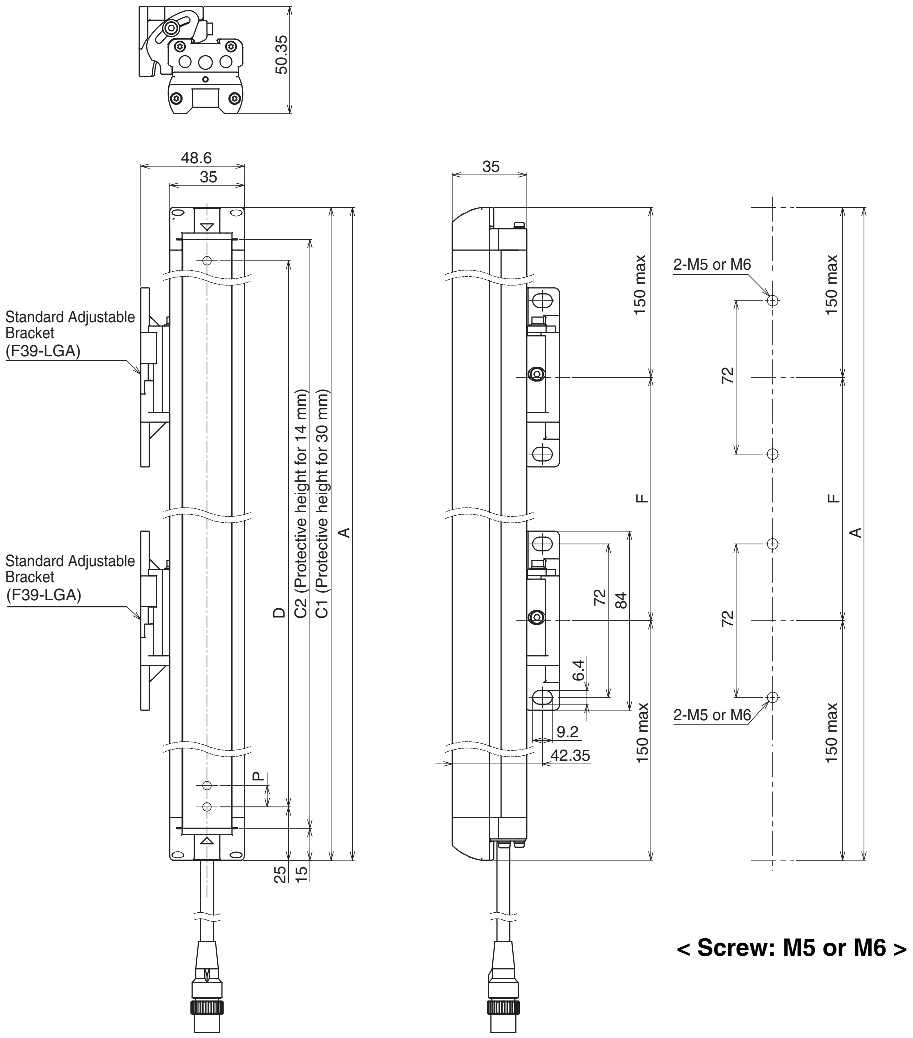
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Adjustable Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Side Mounting


50.35
48.6
35
35
Standard Adjustable Bracket (F39-LGA)
Standard Adjustable Bracket (F39-LGA)
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
25
15
150 max
F
150 max
72
84
6.4
9.2
42.35
2-M5 or M6
2-M5 or M6
72
72
150 max
F
A
150 max
< Screw: M5 or M6 >

F3SG-4RE□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

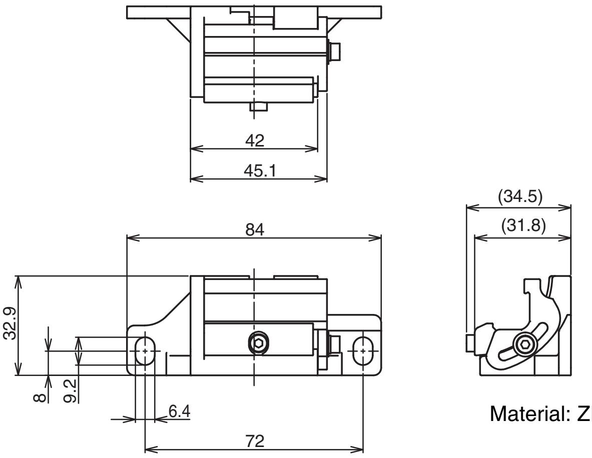
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

Protective height (C2)	Number of Standard Adjustable Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Standard Fixed Bracket (F39-LGA)

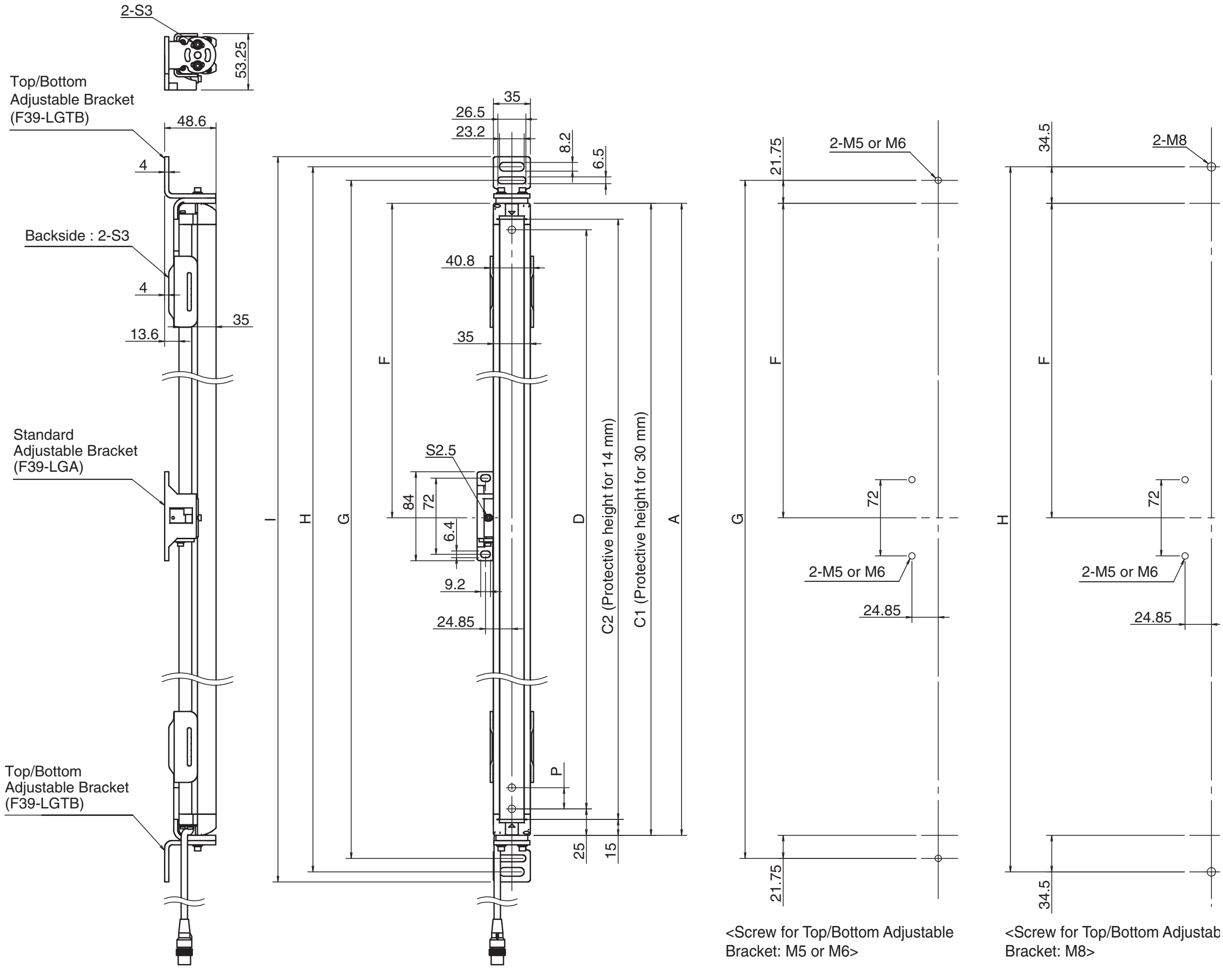

42
45.1
84
32.9
8
9.2
6.4
72
(34.5)
(31.8)

Material: ZDC2, Fluorochemical lubricant oil

Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and Standard Adjustable Brackets (F39-LGA)

Dimensions when using the F3SG-RE Series except the F3SG-4RE0190□30 and F3SG-4RE0160□14
Refer to *Safety Light Curtain F3SG-R Series User's Manual* for the dimensions when using the F3SG-4RE0190□30 and F3SG-4RE0160□14.

Backside Mounting


2-S3
53.25
Top/Bottom Adjustable Bracket (F39-LGTB)
48.6
4
Backside : 2-S3
4
13.6
35
Standard Adjustable Bracket (F39-LGA)
Top/Bottom Adjustable Bracket (F39-LGTB)
35
26.5
23.2
8.2
6.5
40.8
35
F
S2.5
84
72
6.4
9.2
24.85
I
H
G
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
25
15
21.75
2-M5 or M6
F
G
72
2-M5 or M6
24.85
21.75
34.5
2-M8
F
H
72
2-M5 or M6
24.85
34.5

<Screw for Top/Bottom Adjustable Bracket: M5 or M6>

<Screw for Top/Bottom Adjustab Bracket: M8>

F3SG-4RE□□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+43.5
Dimension H	C1+69
Dimension I	C1+88
Dimension P	20

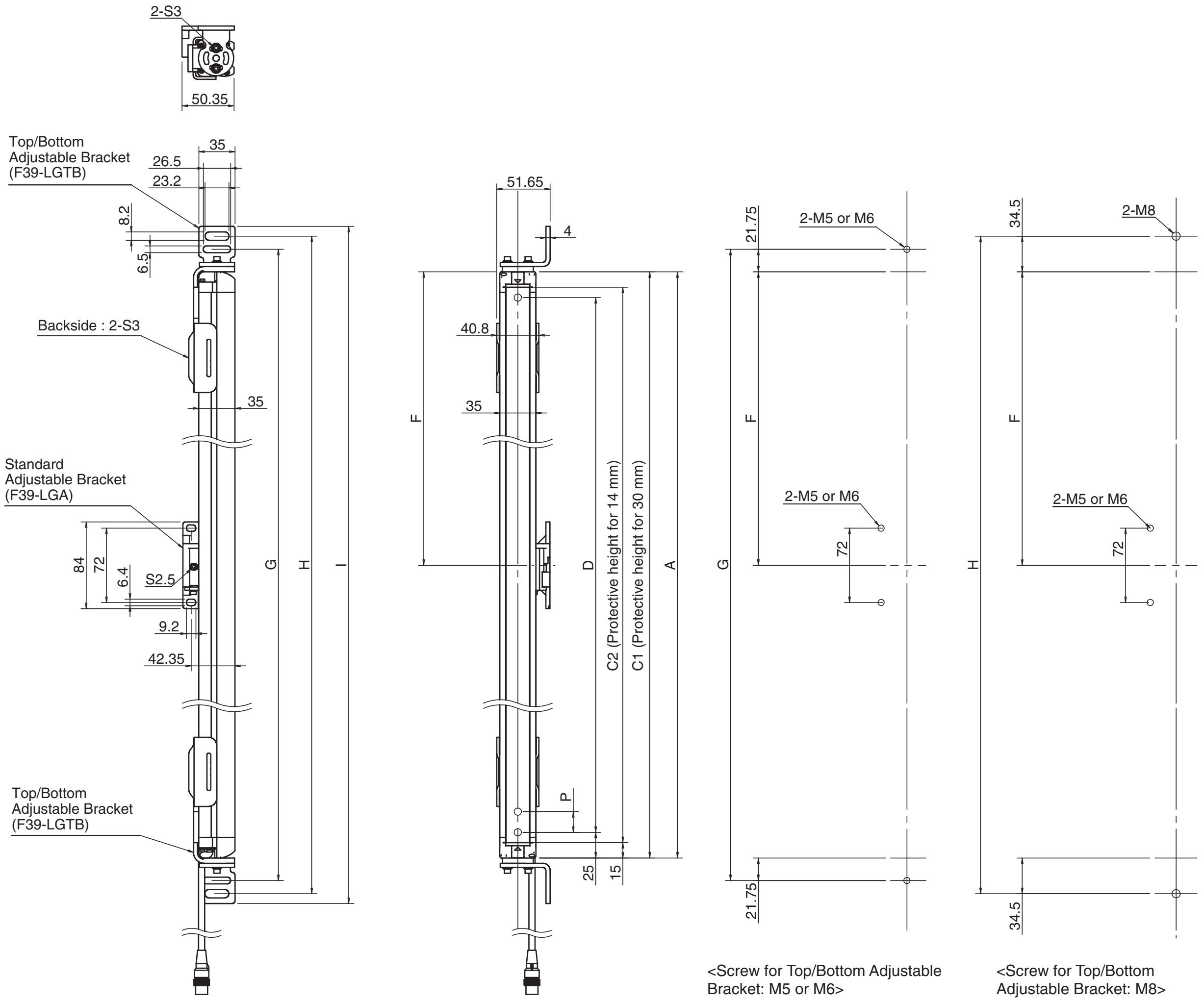
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

F3SG-4RE□□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+73.5
Dimension H	C2+99
Dimension I	C2+118
Dimension P	10

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0240 to 1040	2	0	–
1120 to 1920	2	1	1000 mm max.
2000 to 2080	2	2	1000 mm max.

Side Mounting


2-S3
50.35
Top/Bottom Adjustable Bracket (F39-LGTB)
35
26.5
23.2
8.2
6.5
Backside : 2-S3
35
Standard Adjustable Bracket (F39-LGA)
84
72
6.4
S2.5
9.2
42.35
G
H
I
Top/Bottom Adjustable Bracket (F39-LGTB)
51.65
4
40.8
35
F
D
C2 (Protective height for 14 mm)
C1 (Protective height for 30 mm)
A
P
25
15
21.75
2-M5 or M6
F
2-M5 or M6
72
G
21.75
34.5
2-M8
F
2-M5 or M6
72
H
34.5

<Screw for Top/Bottom Adjustable Bracket: M5 or M6>

<Screw for Top/Bottom Adjustable Bracket: M8>

F3SG-4RE□□□□30 Series

Dimension A	C1
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+43.5
Dimension H	C1+69
Dimension I	C1+88
Dimension P	20

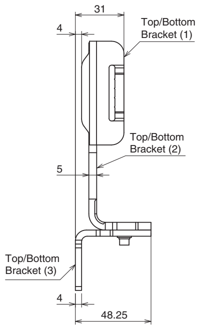
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

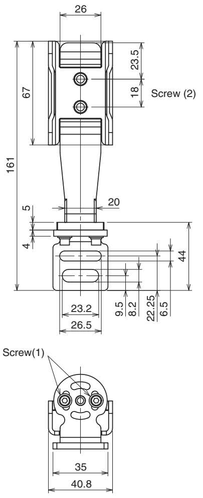
F3SG-4RE□□□□14 Series

Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+73.5
Dimension H	C2+99
Dimension I	C2+118
Dimension P	10

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0240 to 1040	2	0	–
1120 to 1920	2	1	1000 mm max.
2000 to 2080	2	2	1000 mm max.

Top/Bottom Adjustable Bracket (F39-LGTB)

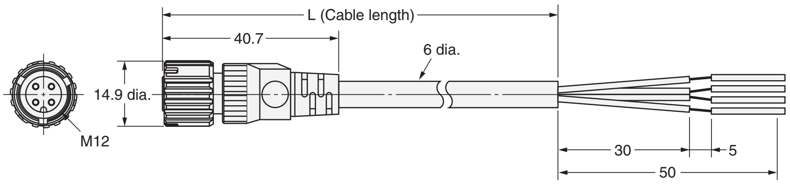

31
4
Top/Bottom Bracket (1)
Top/Bottom Bracket (2)
5
Top/Bottom Bracket (3)
4
48.25


26
23.5
18
Screw (2)
67
161
5
20
4
44
23.2
26.5
9.5
8.2
22.25
6.5
Screw(1)
35
40.8

Material: SUS304

Accessories

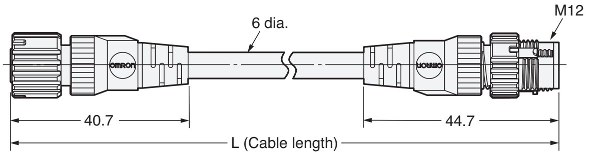
Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)


L (Cable length)
40.7
6 dia.
14.9 dia.
M12
30
5
50

Material: Insulated vinyl round cable

Specification	Model	L (m)
Fire-retardant, Robot cable	**XS5F-D421-C80-F**	1
	XS5F-D421-D80-F	2
	XS5F-D421-E80-F	3
	XS5F-D421-G80-F	5
	XS5F-D421-J80-F	10
	XS5F-D421-L80-F	20

Round Water-resistant Connector: Connectors Connected to Cable, Socket and Plug on Cable Ends (XS5W-D421-□81-F, sold separately)

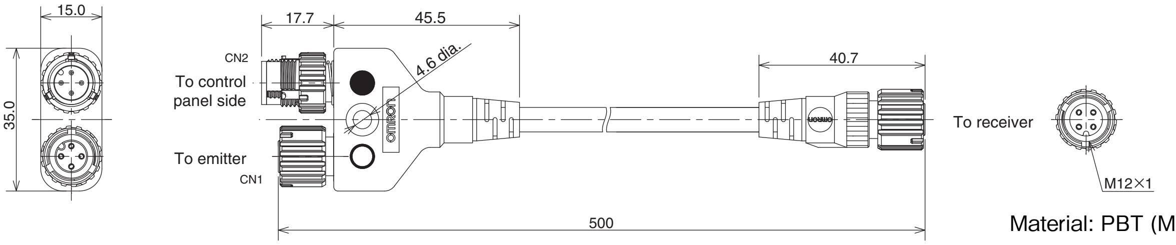

M12
6 dia.
40.7
44.7
L (Cable length)

Material: Insulated vinyl round cable

Specification	Model	L (m)
Fire-retardant, Robot cable	**XS5W-D421-C81-F**	1
	XS5W-D421-D81-F	2
	XS5W-D421-E81-F	3
	XS5W-D421-G81-F	5
	XS5W-D421-J81-F	10
	XS5W-D421-L81-F	20

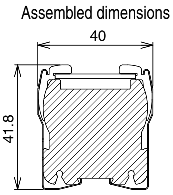
Y-Joint Plug/Socket Connector (F39-GCNY1, sold separately)

Plug marked with ● (bule circle): Connect to control panel side
Socket marked with ○ (white circle): Connect to emitter


15.0
35.0
17.7
45.5
4.6 dia.
CN2
To control panel side
To emitter
CN1
40.7
To receiver
M12×1
500

Material: PBT (Main body)

Spatter Protection Cover(F39-HGA/-HGB)


Assembled dimensions
40
41.8

Model	Total length
F39-HGB□□□□	□□□□+6
F39-HGA0550	558

Material: PC (Transparent cover)
ABS (Side wall)
Stainless steel (Bracket)
Aluminum adhesive tape
(Fixing sticker)

Related Manuals

ManNo.	Model	Manual name
Z352	**F3SG-□R□□□□□□□□**	Safety Light Curtain F3SG-□R Series User's Manual

Smart Muting Actuator
F3W-MA

Integrated muting sensor based on multi-beam photoelectric sensor

CE

- A muting system can be configured easily in combination with the safety light curtain.
- Muting functions can be stably performed even when workpieces with holes pass.

Ordering Information

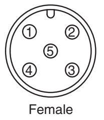
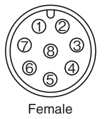
Smart Muting Actuator

Appearance	Beam Gap between Muting Trigger Beams	output	Number of Beams	Model
	100 mm	PNP output	8	**F3W-MA0100P**
	300 mm		20	**F3W-MA0300P**

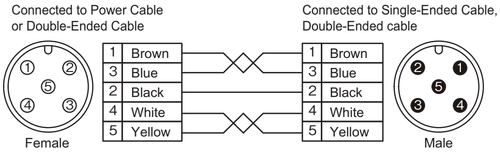
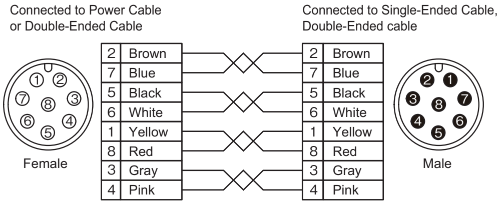
Note: Use with the PNP output model safety light curtain.

Accessories (Sold separately)

Single-ended Connector Cable

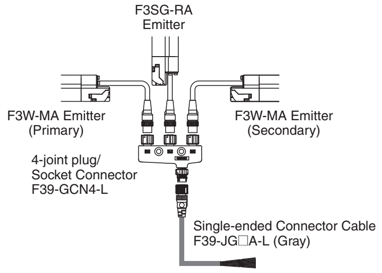
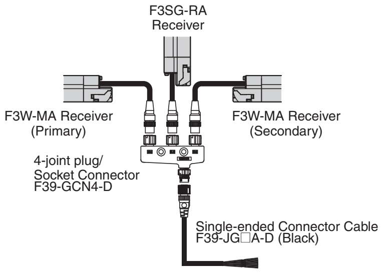
Appearance	Type	Cable length	Specifications	Model
	M12 connector (5-pin), 5 wires Color: Gray	3 m	 Female 1 | +24 VDC | Brown 2 | CFG In | Black 3 | 0 VDC | Blue 4 | COM+ | White 5 | COM- | Yellow	**F39-JG3A-L**
		7 m		**F39-JG7A-L**
		10 m		**F39-JG10A-L**
		15 m		**F39-JG15A-L**
		20 m		**F39-JG20A-L**
	For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	 Female 1 | Mute Enable / CFG In / Reset | Yellow 2 | +24 VDC | Brown 3 | COM+ | Gray 4 | COM- | Pink 5 | Muting Output A | Black 6 | Muting Output B | White 7 | 0 VDC | Blue 8 | CFG Out | Red	**F39-JG3A-D**
		7 m		**F39-JG7A-D**
		10 m		**F39-JG10A-D**
		15 m		**F39-JG15A-D**
		20 m		**F39-JG20A-D**

Double-en1ded Cable

Appearance	Type	Cable length	Specifications	Model
	M12 connector (5-pin) on both ends Color: Gray	0.5 m	 Connected to Power Cable or Double-Ended Cable | Connected to Single-Ended Cable, Double-Ended cable 1 Brown — 1 Brown 3 Blue — 3 Blue 2 Black — 2 Black 4 White — 4 White 5 Yellow — 5 Yellow Female | Male	**F39-JGR5B-L**
		1 m		**F39-JG1B-L**
		3 m		**F39-JG3B-L**
		5 m		**F39-JG5B-L**
		7 m		**F39-JG7B-L**
		10 m		**F39-JG10B-L**
		15 m		**F39-JG15B-L**
		20 m		**F39-JG20B-L**
	M12 connector (8-pin) on both ends Color: Black	0.5 m	 Connected to Power Cable or Double-Ended Cable | Connected to Single-Ended Cable, Double-Ended cable 2 Brown — 2 Brown 7 Blue — 7 Blue 5 Black — 5 Black 6 White — 6 White 1 Yellow — 1 Yellow 8 Red — 8 Red 3 Gray — 3 Gray 4 Pink — 4 Pink Female | Male	**F39-JGR5B-D**
		1 m		**F39-JG1B-D**
		3 m		**F39-JG3B-D**
		5 m		**F39-JG5B-D**
		7 m		**F39-JG7B-D**
		10 m		**F39-JG10B-D**
		15 m		**F39-JG15B-D**
		20 m		**F39-JG20B-D**

4-Joint Plug/Socket Connector

Used for reduced wiring for connecting F3W-MA with F3SG-RA.

Appearance	Type	Specifications	Model
	For emitter M12 connectors. Used for reduced wiring.	 F3SG-RA Emitter F3W-MA Emitter (Primary) F3W-MA Emitter (Secondary) 4-joint plug/ Socket Connector F39-GCN4-L Single-ended Connector Cable F39-JG□A-L (Gray)	**F39-GCN4-L**
	For receiver(PNP output) M12 connectors. Used for reduced wiring.	 F3SG-RA Receiver F3W-MA Receiver (Primary) F3W-MA Receiver (Secondary) 4-joint plug/ Socket Connector F39-GCN4-D Single-ended Connector Cable F39-JG□A-D (Black)	**F39-GCN4-D**
	Includes one each of F39-GCN4-L and F39-GCN4-D	–	**F39-GCN4**

Sensor Mounting Brackets

Appearance	Specification	Application	Remarks	Model
	Standard Fixed Bracket	Bracket to mount the F3W-MA. Side mounting and backside mounting possible.	Two brackets per set	**F39-LGF**
	Standard Adjustable Bracket	Bracket to mount the F3W-MA. Beam alignment after mounting possible.The angle adjustment range is ±15°. Side mounting and backside mounting possible.	Two brackets per set	**F39-LGA**

Ratings/Specifications

			F3W-MA0100P	F3W-MA0300P
Perfor-mance	**Beam Gap between Muting Trigger Beams**		100mm	300mm
	Number of Beams		8	20
	Standard Detection Object		30mm	
	Operating Range	**Long**	0.3 to 20.0 m (1 to 65 ft.)	
		Short	0.3 to 7.0 m (1 to 23 ft.)	
	Response Time	**Operation**	13 ms max.	
		Reset	26 ms max. (Synchronized) 78 ms max. (Not synchronized)	
	Effective Aperture Angle		±2.5° max., emitter and receiver at operating range of 3 m or greater	
	Light Source		Infrared LEDs, Wavelength: 870 nm	
	Startup Waiting Time		2 s max.	
Electrical	**Power Supply Voltage (Vs)**		SELV/PELV 24 VDC±20% (ripple p-p 10% max.)	
	Current Consumption	**Emitter**	35mA	45mA
		Receiver	75mA	75mA
	Muting Outputs		Two PNP transistor outputs. * Load current of 300 mA max., Residual voltage of 2 V max. (except for voltage drop due to cable extension)j	
		* This product is a PNP output model. Use with the PNP output model safety light curtain.		
	Output Opera-tion Mode	**Muting Output A**	Dark-ON (Muting Output A is enabled when MuteA trigger beam is blocked.)	
		Muting Output B	Dark-ON (Muting Output B is enabled when MuteB trigger beam is blocked.)	
	Input Voltage	**ON Voltage**	[MuteEnable] Vs to Vs-3 V (sink current 5 mA max.) *	
		OFF Voltage	[Mute Enable] 0 to 1/2 Vs, or open *	
		* The Vs indicates a supply voltage value in your environment.		
	Indicators		Refer to page 66. LED Indicator Status	
	Protective Circuit		Protective Circuit Output short protection, Power supply reverse polarity protection	
	Insulation Resistance		20 MΩ or higher (500 VDC megger)	
	Dielectric Strength		1,000 VAC, 50/60 Hz (1 min)	
Functional	**Functions**		- Scan Code Selection - Operation Mode Selection (Point to Point Detection/ Chattering and Void Space Prevention) - Off-Delay - Muting Enable - Muting Trigger Beam Allocation - Operating Range Selection	
Environ-mental	**Ambient Temperature**	**Operating**	-10 to 55°C (13 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	**Operating**	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance		Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of Protection (IEC 60529)		IP65 and IP67	
	Vibration Resistance (IEC 61496-1)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
	Shock Resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes	
	Pollution Degree (IEC 60664-1)		Pollution Degree 3	
Connec-tions	**Extension of Power Cable**		100 m max. Note: For T-Shaped configuration with COM lines, the length of cable extension is 30m max.	
Material			Housing: Aluminum, Cap: PBT, Front Window: PMMA, Cable: Oil resistant PVC, FE plate: SUS	
Weight (packaged)			1.8 kg max.	2.8 kg max.
Included Accessories			Instruction Sheet	

LED Indicator Status

Shown below are indication statuses of F3W-MA LED indicators when you purchased.

Emitter

Name of Indicator		Color	Illuminated	Blinking
Operating range	LONG	Green	Long Range mode is selected by DIP Switch.	-
Running	RUN	Green	Power is ON.	-
Error	ERR	Red	-	Error in emitter. Generic error happens.

Receiver

Name of Indicator		Color	Illuminated	Blinking
Top-beam-state	TOP	Blue	The top beam is unblocked.	-
Muting output A	MUTE A	Green	Muting Output A is activated.	-
Muting output B	MUTE B	Green	Muting Output B is activated.	-
Off-Delay	DELAY	Yellow	Off-Delay function is enabled by DIP Switch.	-
Chattering/ Void space	CHAT	Green	Chattering and Void Space Prevention mode is selected by DIP Switch.	-
Muting Enable	MUTE DISABLE	Red	The Muting Enable function is enabled and Muting Enable input is turned OFF by DIP Switch.	-
Error	ERR	Red	-	Error in receiver. Generic error happens.
Stable-state	STB	Green	Incident light level is 170% or higher of ON-threshold	-
Running	RUN	Green	Power is ON.	-
Communication	COM	Green	Synchronization between emitter and receiver is maintained.	[Primary sensor] - Start-up (for approx. 3 s) - Synchronization between emitter and receiver is lost
Bottom-beamstate	BTM	Blue	The bottom beam is unblocked.	-

Wiring Examples

Standard Muting Mode with F3SG-R (T-Shaped Configuration with COM lines)

The following is the example of F3W-MA with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable disabled.

DIP Switch settings *1

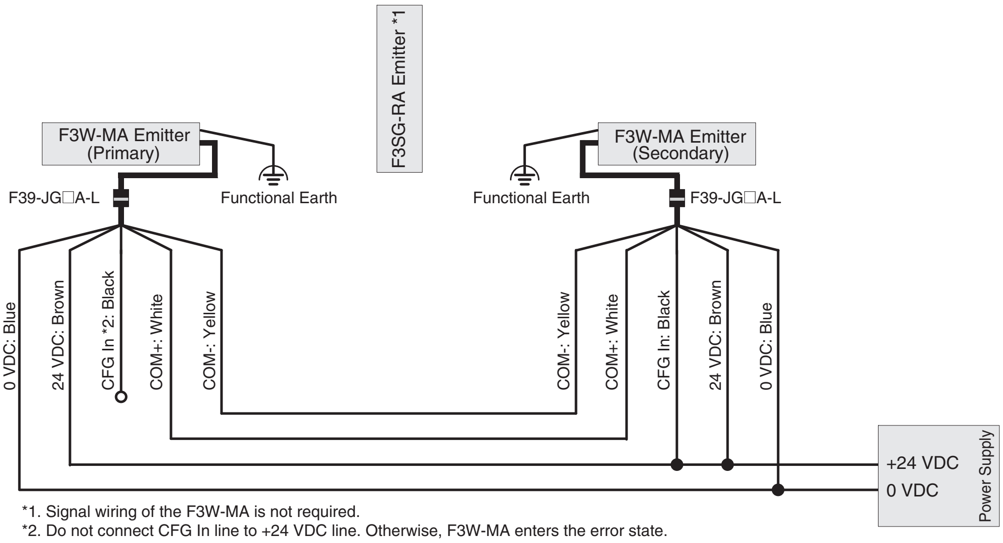
		Function	DIP-SW1	DIP-SW2 *2
F3W-MA Primary	Receiver	Scan Code B (factory default setting)	1 □■ ON	1 □■ ON
		Chattering and Void Space Prevention 1	2 ■□ ON 3 □■ ON	2 □■ ON 3 □■ ON
		Off-Delay 100 ms	4 ■□ ON 5 □■ ON	4 □■ ON 5 □■ ON
		Muting Enable Disabled (factory default setting)	6 □■ ON	6 □■ ON
	Emitter	Scan Code B (factory default setting)	1 □■ ON	–
F3W-MA Secondary	Receiver Emitter	–	No setting required	No setting required

□: Indicates a switch position.

*1.Configure functions with the DIP Switches before wiring. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.
*2.DIP Switch Bank 2 is not used.

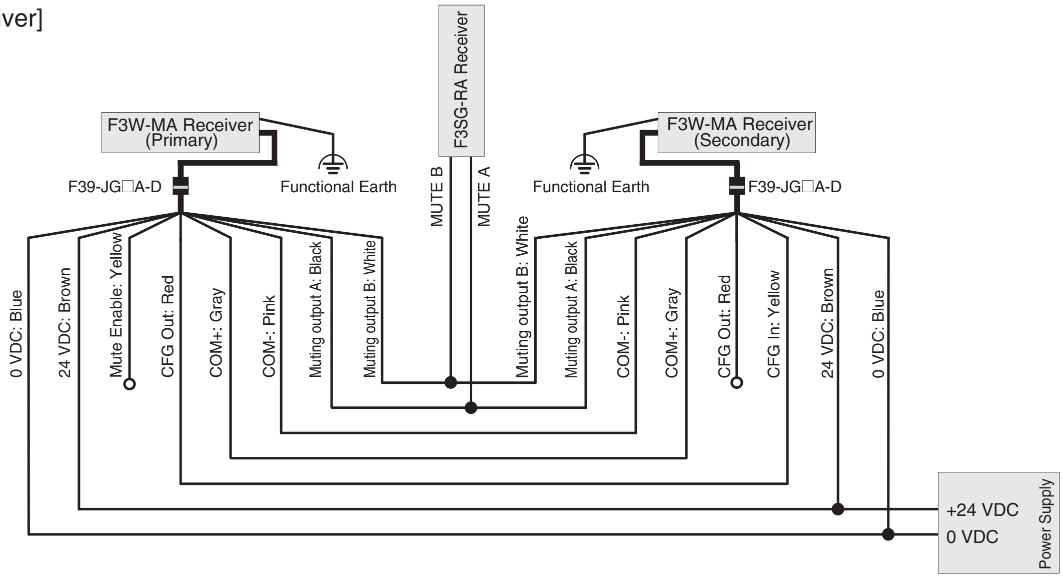
Wiring example

[Emitter]


F3SG-RA Emitter *1
F3W-MA Emitter (Primary)
F3W-MA Emitter (Secondary)
F39-JG□A-L
Functional Earth
Functional Earth
F39-JG□A-L
0 VDC: Blue
24 VDC: Brown
CFG In *2: Black
COM+: White
COM-: Yellow
COM-: Yellow
COM+: White
CFG In: Black
24 VDC: Brown
0 VDC: Blue
+24 VDC
0 VDC
Power Supply

*1. Signal wiring of the F3W-MA is not required.
*2. Do not connect CFG In line to +24 VDC line. Otherwise, F3W-MA enters the error state.

[Receiver]


F3SG-RA Receiver
F3W-MA Receiver (Primary)
F3W-MA Receiver (Secondary)
F39-JG□A-D
Functional Earth
MUTE B
MUTE A
Functional Earth
F39-JG□A-D
0 VDC: Blue
24 VDC: Brown
Mute Enable: Yellow
CFG Out: Red
COM+: Gray
COM-: Pink
Muting output A: Black
Muting output B: White
Muting output B: White
Muting output A: Black
COM-: Pink
COM+: Gray
CFG Out: Red
CFG In: Yellow
24 VDC: Brown
0 VDC: Blue
+24 VDC
0 VDC
Power Supply

Note: The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.

Standard Muting Mode with F3SG-R (T-Shaped Configuration with 4-Joint Connector)

The following is the example of F3SG-RA with Scan Code B, External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active, and F3W-MA with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable disabled.

DIP Switch settings*1

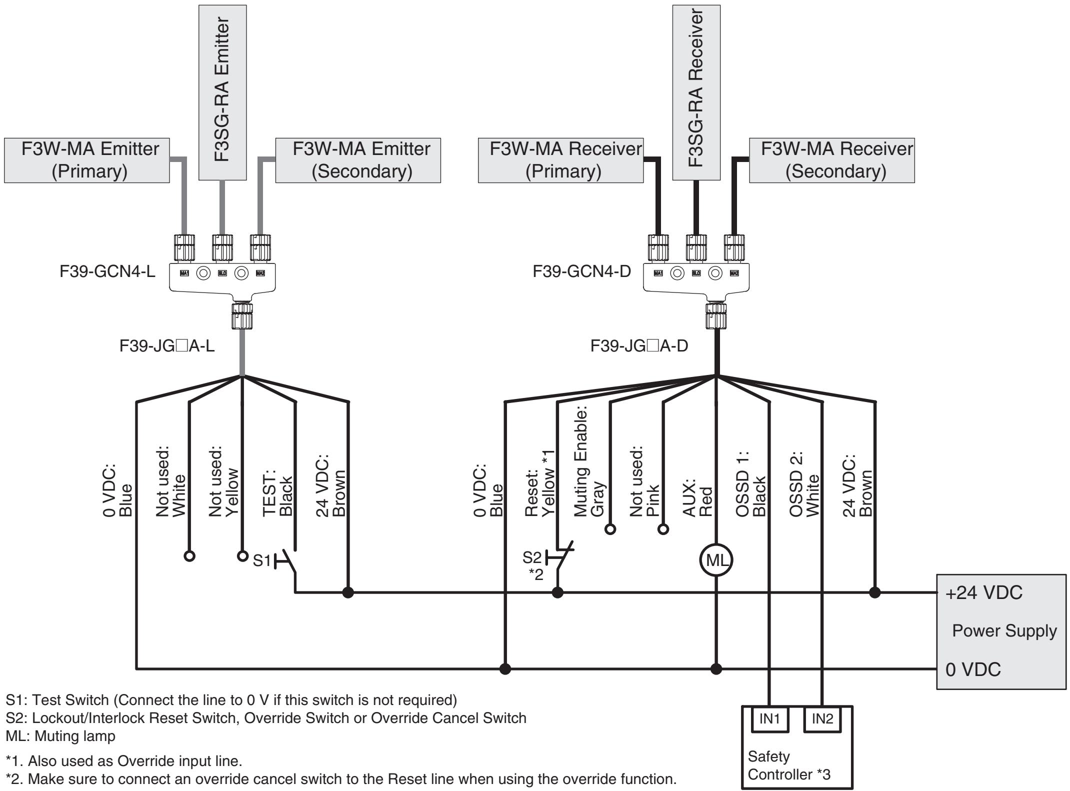
		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code B	1 ■☐ ON	1 ■☐ ON
		EDM Disabled (factory default setting)	2 ☐■ ON	2 ☐■ ON
		Auto Reset (factory default setting)	3 ☐■ ON	3 ☐■ ON
			4 ☐■ ON	4 ☐■ ON
		PNP (factory default setting)	7 ☐■ ON	7 ☐■ ON
	Emitter	Scan Code B	1 ■☐ ON	–
		External Test: 24 V Active (factory default setting)	4 ☐■ ON	–
F3W-MA Primary	Receiver	Scan Code A	1 ■☐ ON	1 ☐■ ON*2
		Chattering and Void Space Prevention 1	2 ■☐ ON 3 ☐■ ON	2 ☐■ ON*2 3 ☐■ ON*2
		Off-Delay 100 ms	4 ■☐ ON 5 ☐■ ON	4 ☐■ ON*2 5 ☐■ ON*2
		Muting Enable Disabled (factory default setting)	6 ☐■ ON	6 ☐■ ON*2
	Emitter	Scan Code A	1 ■☐ ON	–
F3W-MA Secondary	Receiver Emitter	–	No setting required	No setting required

☐: Indicates a switch position.

*1.Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual.*

*2.DIP Switch Bank 2 of F3W-MA receiver is not used.

Wiring example


F3SG-RA Emitter
F3W-MA Emitter (Primary)
F3W-MA Emitter (Secondary)
F39-GCN4-L
F39-JG☐A-L
0 VDC: Blue
Not used: White
Not used: Yellow
TEST: Black
24 VDC: Brown
S1
F3SG-RA Receiver
F3W-MA Receiver (Primary)
F3W-MA Receiver (Secondary)
F39-GCN4-D
F39-JG☐A-D
0 VDC: Blue
Reset: Yellow *1
Muting Enable: Gray
Not used: Pink
AUX: Red
OSSD 1: Black
OSSD 2: White
24 VDC: Brown
S2 *2
ML
+24 VDC
Power Supply
0 VDC
IN1
IN2
Safety Controller *3

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
ML: Muting lamp

*1. Also used as Override input line.
*2. Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
*3. Refer to page 29 for more information on connectable safety controller units.

Exit-Only Muting Mode with F3SG-R (L-Shaped Configuration)

The following is the example of F3W-MA with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

DIP Switch settings*1

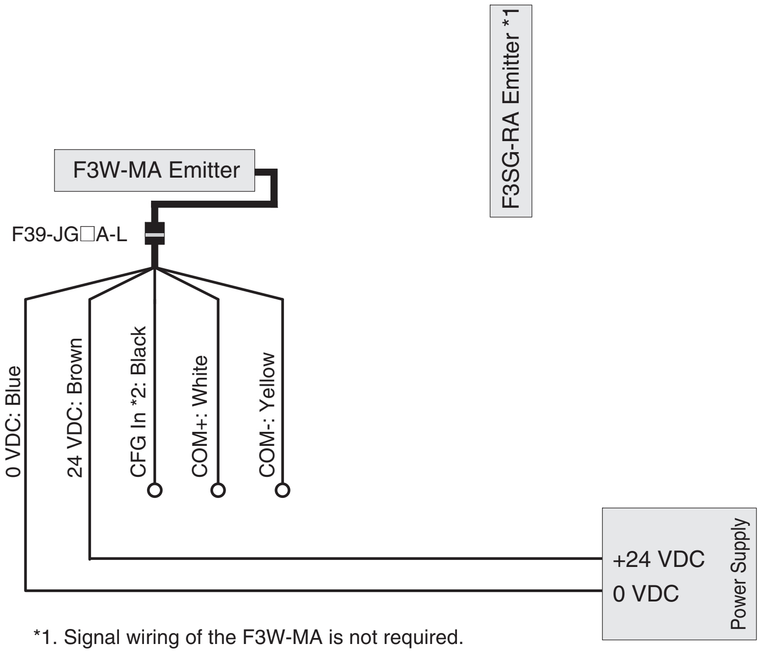
		Function	DIP-SW1	DIP-SW2 *2
F3W-MA	Receiver	Scan Code A	1 ■□ ON	1 □■ ON
		Chattering and Void Space Prevention 1	2 ■□ ON 3 □■ ON	2 □■ ON 3 □■ ON
		Off-Delay 100 ms	4 ■□ ON 5 □■ ON	4 □■ ON 5 □■ ON
		Muting Enable Enabled	6 ■□ ON	6 □■ ON
	Emitter	Scan Code A	1 ■□ ON	–

□: Indicates a switch position.

*1.Configure functions with the DIP Switches before wiring. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.
*2.DIP Switch Bank 2 is not used.

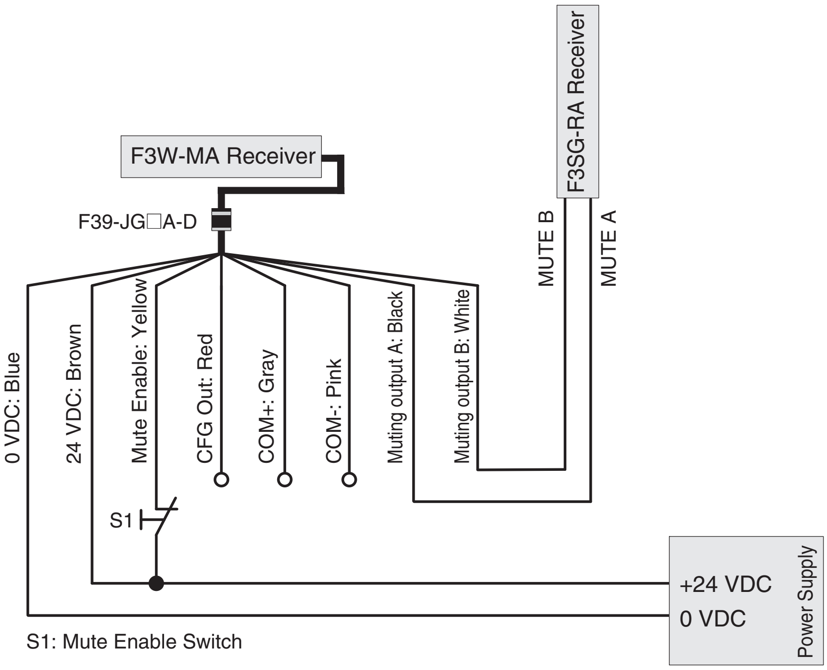
Wiring example

[Emitter]


F3SG-RA Emitter *1
F3W-MA Emitter
F39-JG□A-L
0 VDC: Blue
24 VDC: Brown
CFG In *2: Black
COM+: White
COM-: Yellow
+24 VDC
0 VDC
Power Supply

*1. Signal wiring of the F3W-MA is not required.
*2. Do not connect CFG In line to +24 VDC line. Otherwise, F3W-MA enters the error state.

[Receiver]


F3SG-RA Receiver
F3W-MA Receiver
F39-JG□A-D
MUTE B
MUTE A
0 VDC: Blue
24 VDC: Brown
Mute Enable: Yellow
CFG Out: Red
COM+: Gray
COM-: Pink
Muting output A: Black
Muting output B: White
S1
+24 VDC
0 VDC
Power Supply

S1: Mute Enable Switch

Exit-Only Muting Mode with F3SG-R (L-Shaped Configuration with 4-Joint Connector)

The following is the example of F3SG-RA with Scan Code A, External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active, and F3W-MA with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

DIP Switch settings*1

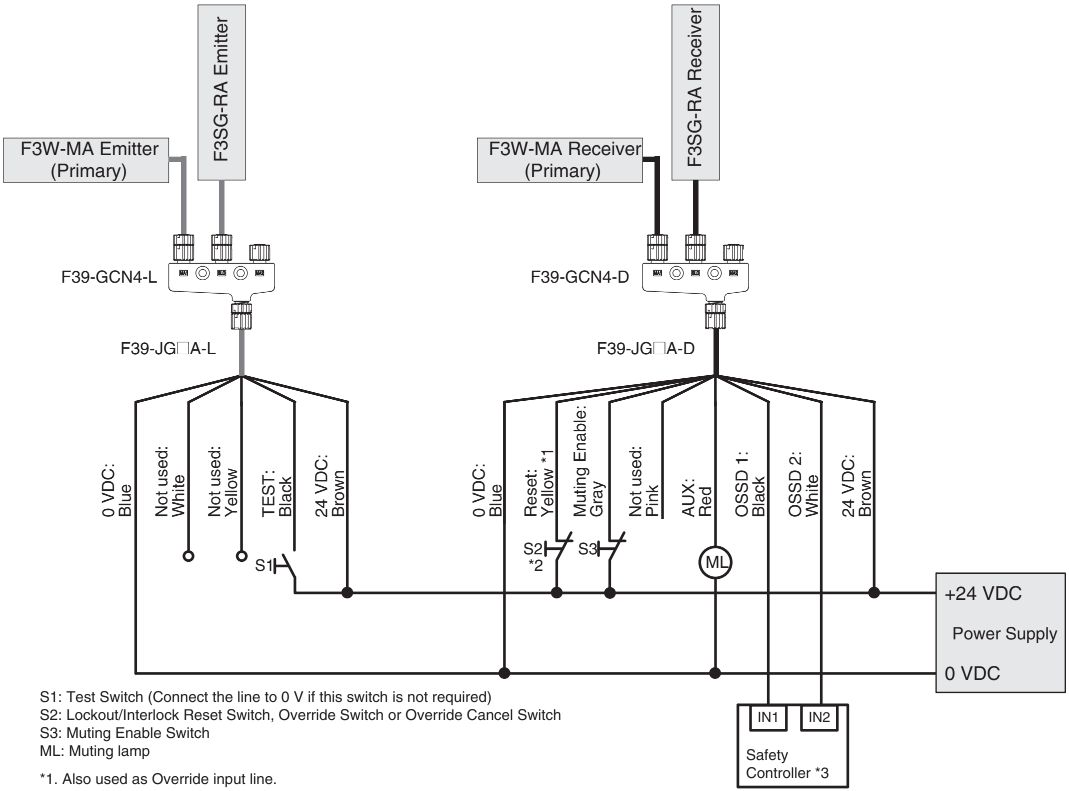
		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code A (factory default setting)	1 ☐■ ON	1 ☐■ ON
		EDM Disabled (factory default setting)	2 ☐■ ON	2 ☐■ ON
		Auto Reset (factory default setting)	3 ☐■ ON	3 ☐■ ON
			4 ☐■ ON	4 ☐■ ON
		PNP (factory default setting)	7 ☐■ ON	7 ☐■ ON
	Emitter	Scan Code A (factory default setting)	1 ☐■ ON	–
		External Test: 24 V Active (factory default setting)	4 ☐■ ON	–
F3W-MA	Receiver	Scan Code B (factory default setting)	1 ☐■ ON	1 ☐■ ON*2
		Chattering and Void Space Prevention 1	2 ■☐ ON 3 ☐■ ON	2 ☐■ ON*2 3 ☐■ ON*2
		Off-Delay 100 ms	4 ■☐ ON 5 ☐■ ON	4 ☐■ ON*2 5 ☐■ ON*2
		Muting Enable Enabled	6 ■☐ ON	6 ☐■ ON*2
	Emitter	Scan Code B (factory default setting)	1 ☐■ ON	–

☐: Indicates a switch position.

*1.Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual*.

*2.DIP Switch Bank 2 of F3W-MA receiver is not used.

Wiring example


F3SG-RA Emitter
F3W-MA Emitter (Primary)
F3SG-RA Receiver
F3W-MA Receiver (Primary)
F39-GCN4-L
F39-GCN4-D
F39-JG☐A-L
F39-JG☐A-D
0 VDC: Blue
Not used: White
Not used: Yellow
TEST: Black
24 VDC: Brown
S1
0 VDC: Blue
Reset: Yellow *1
Muting Enable: Gray
Not used: Pink
AUX: Red
OSSD 1: Black
OSSD 2: White
24 VDC: Brown
S2 *2
S3
ML
+24 VDC
Power Supply
0 VDC
IN1
IN2
Safety Controller *3

S1: Test Switch (Connect the line to 0 V if this switch is not required)
S2: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
S3: Muting Enable Switch
ML: Muting lamp

*1. Also used as Override input line.

*2. Make sure to connect an override cancel switch to the Reset line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

*3. Refer to page 29 for more information on connectable safety controller units.

Standard Muting Mode with Other Safety Component (T-Shaped Configuration)

The following is the example of F3W-MA-1 with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled, and F3W-MA-2 with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

DIP Switch settings*1

		Function	DIP-SW1	DIP-SW2 *2
F3W-MA-1	Receiver	Scan Code A	1 ■□ ON	1 □■ ON
		Chattering and Void Space Prevention 1	2 ■□ ON 3 □■ ON	2 □■ ON 3 □■ ON
		Off-Delay 100 ms	4 ■□ ON 5 □■ ON	4 □■ ON 5 □■ ON
		Muting Enable Enabled	6 ■□ ON	6 □■ ON
	Emitter	Scan Code A	1 ■□ ON	–
F3W-MA-2	Receiver	Scan Code B (factory default setting)	1 □■ ON	1 □■ ON
		Chattering and Void Space Prevention 1	2 ■□ ON 3 □■ ON	2 □■ ON 3 □■ ON
		Off-Delay 100 ms	4 ■□ ON 5 □■ ON	4 □■ ON 5 □■ ON
		Muting Enable Enabled	6 ■□ ON	6 □■ ON
	Emitter	Scan Code B (factory default setting)	1 □■ ON	–

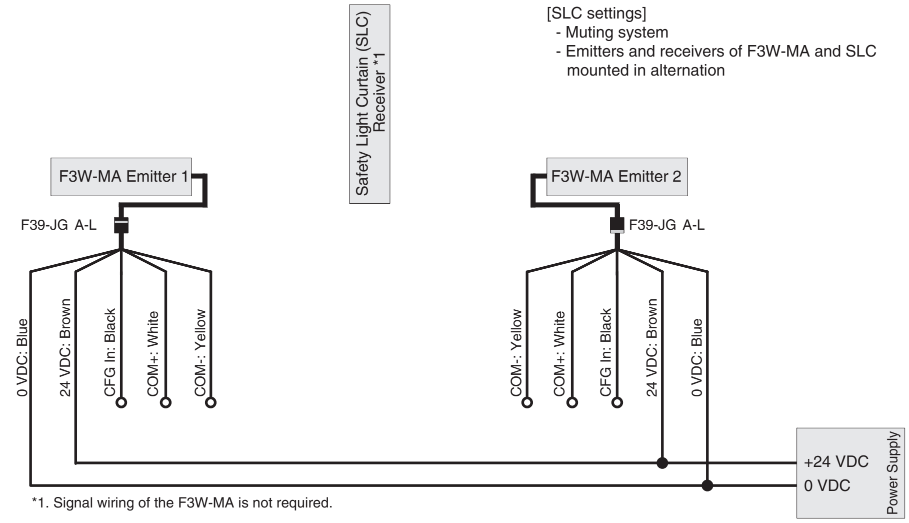
□: Indicates a switch position.

*1.Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual*.

*2.DIP Switch Bank 2 is not used.

Wiring example

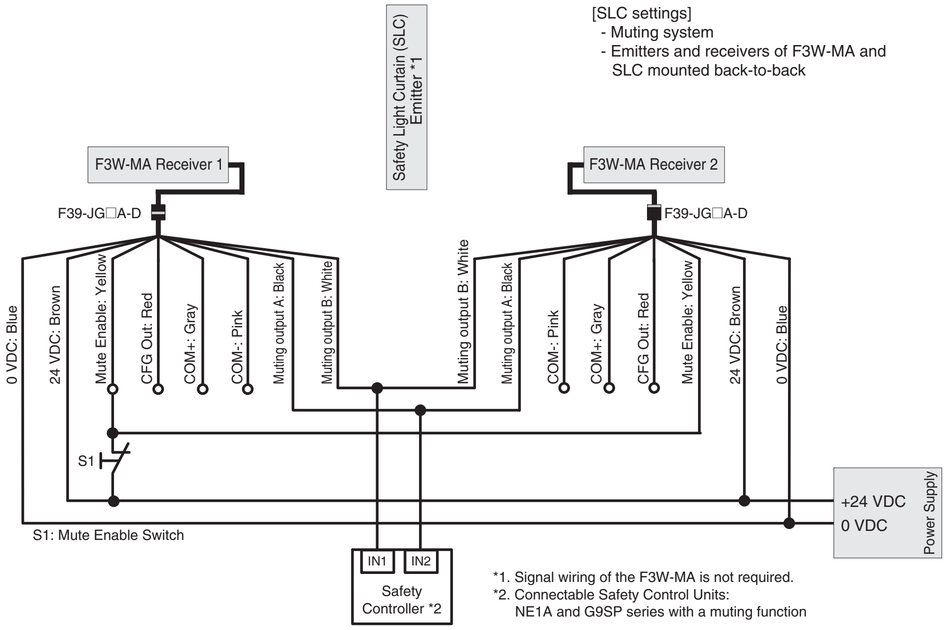
[Emitter]


Safety Light Curtain (SLC)
Receiver *1
F3W-MA Emitter 1
F39-JG A-L
0 VDC: Blue
24 VDC: Brown
CFG In: Black
COM+: White
COM-: Yellow
F3W-MA Emitter 2
F39-JG A-L
COM-: Yellow
COM+: White
CFG In: Black
24 VDC: Brown
0 VDC: Blue
+24 VDC
0 VDC
Power Supply

[SLC settings]
- Muting system
- Emitters and receivers of F3W-MA and SLC mounted in alternation

*1. Signal wiring of the F3W-MA is not required.

[Receiver]


Safety Light Curtain (SLC)
Emitter *1
F3W-MA Receiver 1
F39-JG□A-D
0 VDC: Blue
24 VDC: Brown
Mute Enable: Yellow
CFG Out: Red
COM+: Gray
COM-: Pink
Muting output A: Black
Muting output B: White
F3W-MA Receiver 2
F39-JG□A-D
Muting output B: White
Muting output A: Black
COM-: Pink
COM+: Gray
CFG Out: Red
Mute Enable: Yellow
24 VDC: Brown
0 VDC: Blue
S1
+24 VDC
0 VDC
Power Supply
IN1
IN2
Safety
Controller *2

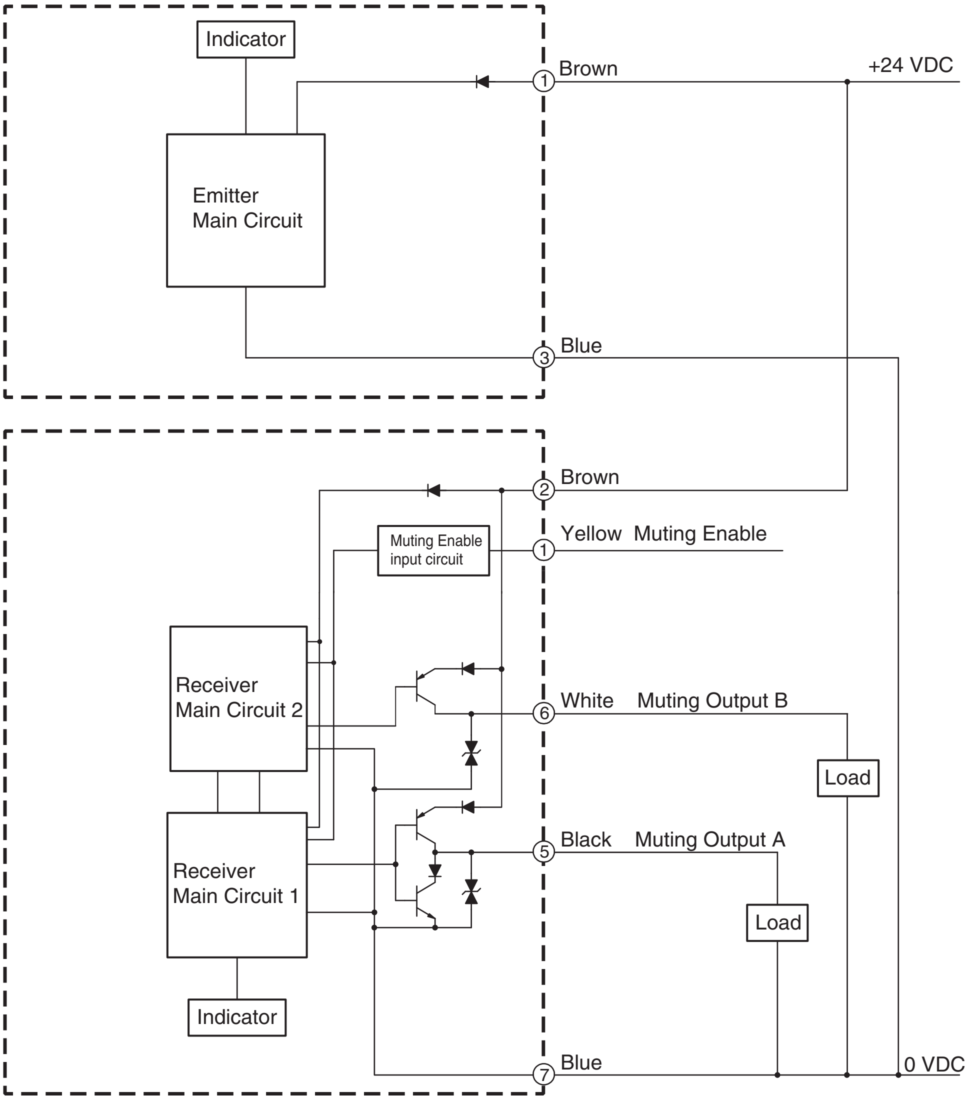
[SLC settings]
- Muting system
- Emitters and receivers of F3W-MA and SLC mounted back-to-back

S1: Mute Enable Switch

*1. Signal wiring of the F3W-MA is not required.
*2. Connectable Safety Control Units:
NE1A and G9SP series with a muting function

Input/Output Circuit

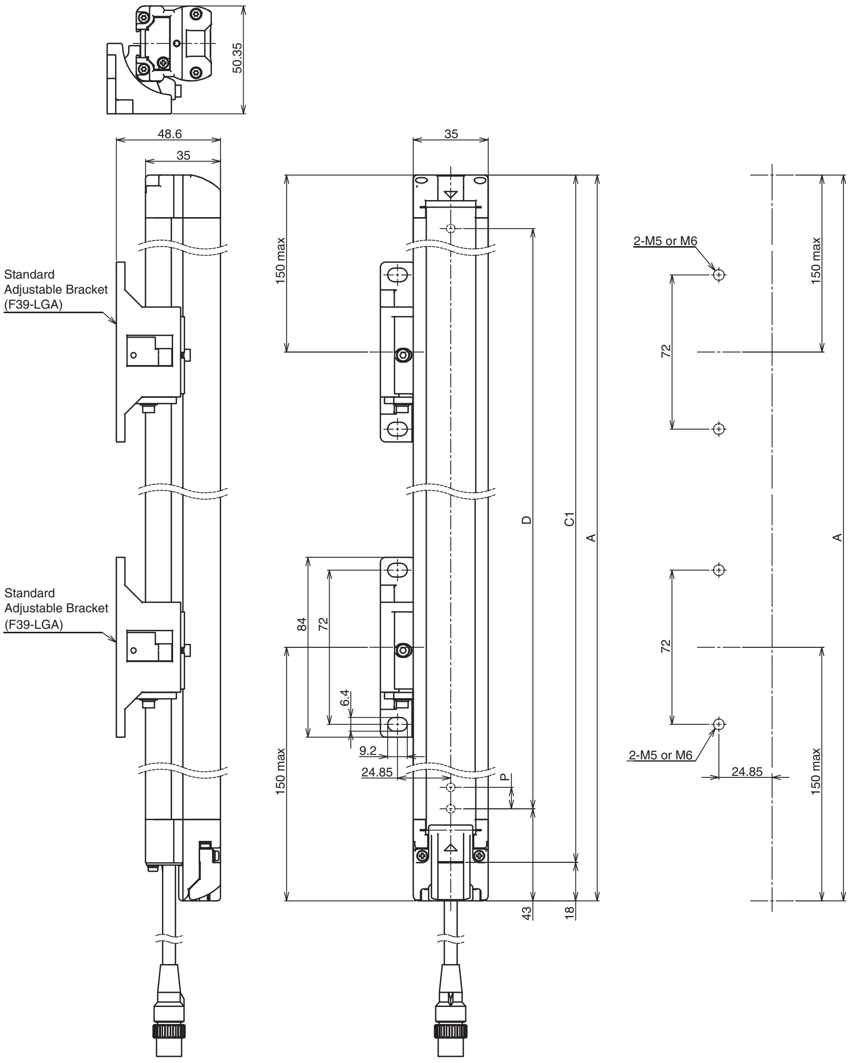
The entire circuit diagram of the F3W-MA is shown below.
The numbers in the circles indicate the connector's pin numbers.


Indicator
Emitter Main Circuit
① Brown
+24 VDC
③ Blue
② Brown
Muting Enable input circuit
① Yellow Muting Enable
Receiver Main Circuit 2
⑥ White Muting Output B
Load
Receiver Main Circuit 1
⑤ Black Muting Output A
Load
Indicator
⑦ Blue
0 VDC

Mounted with Standard Adjustable Brackets (F39-LGA)

(Unit : mm)

Mounted with Standard Adjustable Brackets (F39-LGA)
Backside Mounting

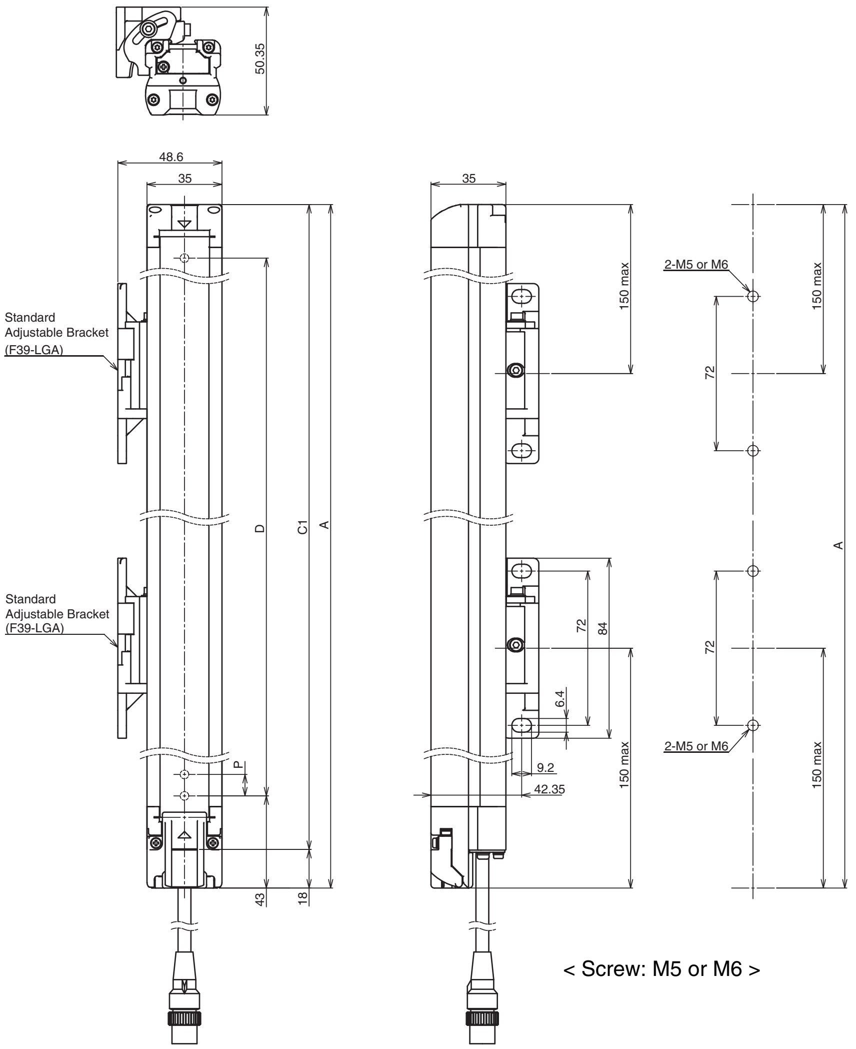

50.35
48.6
35
35
Standard
Adjustable Bracket
(F39-LGA)
150 max
Standard
Adjustable Bracket
(F39-LGA)
84
72
6.4
9.2
24.85
150 max
P
D
C1
A
43
18
2-M5 or M6
150 max
72
A
72
2-M5 or M6
24.85
150 max

< Screw: M5 or M6 >

Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Adjustable Brackets *	2	2

* The number of brackets required to mount either one of emitter and receiver.

Side Mounting

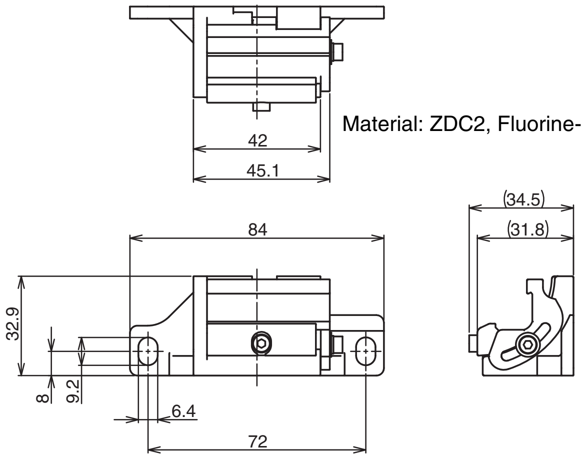

50.35
48.6
35
35
Standard
Adjustable Bracket
(F39-LGA)
Standard
Adjustable Bracket
(F39-LGA)
D
C1
A
P
43
18
150 max
72
84
6.4
9.2
42.35
150 max
2-M5 or M6
72
150 max
A
72
2-M5 or M6
150 max

< Screw: M5 or M6 >

Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Adjustable Brackets *	2	2

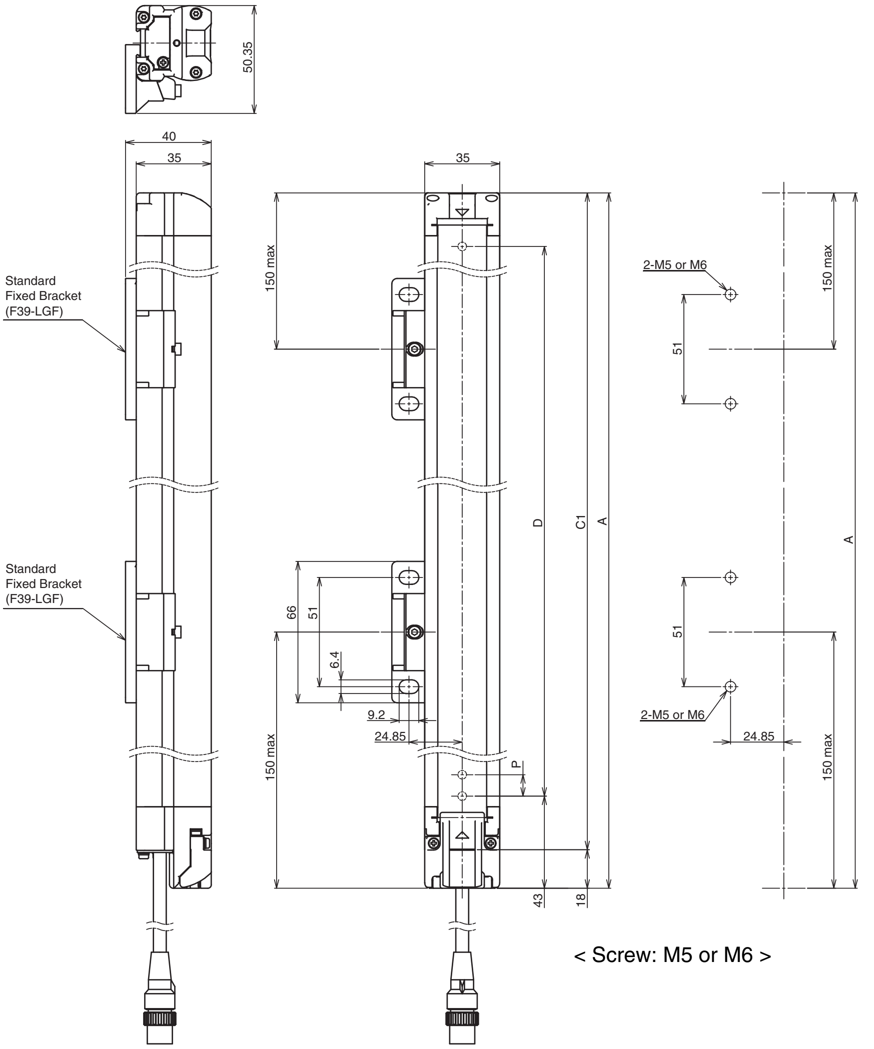
* The number of brackets required to mount either one of emitter and receiver.

Standard Adjustable Bracket (F39-LGA)


42
45.1
84
32.9
8
9.2
6.4
72
(34.5)
(31.8)

Material: ZDC2, Fluorine-containing lubricant

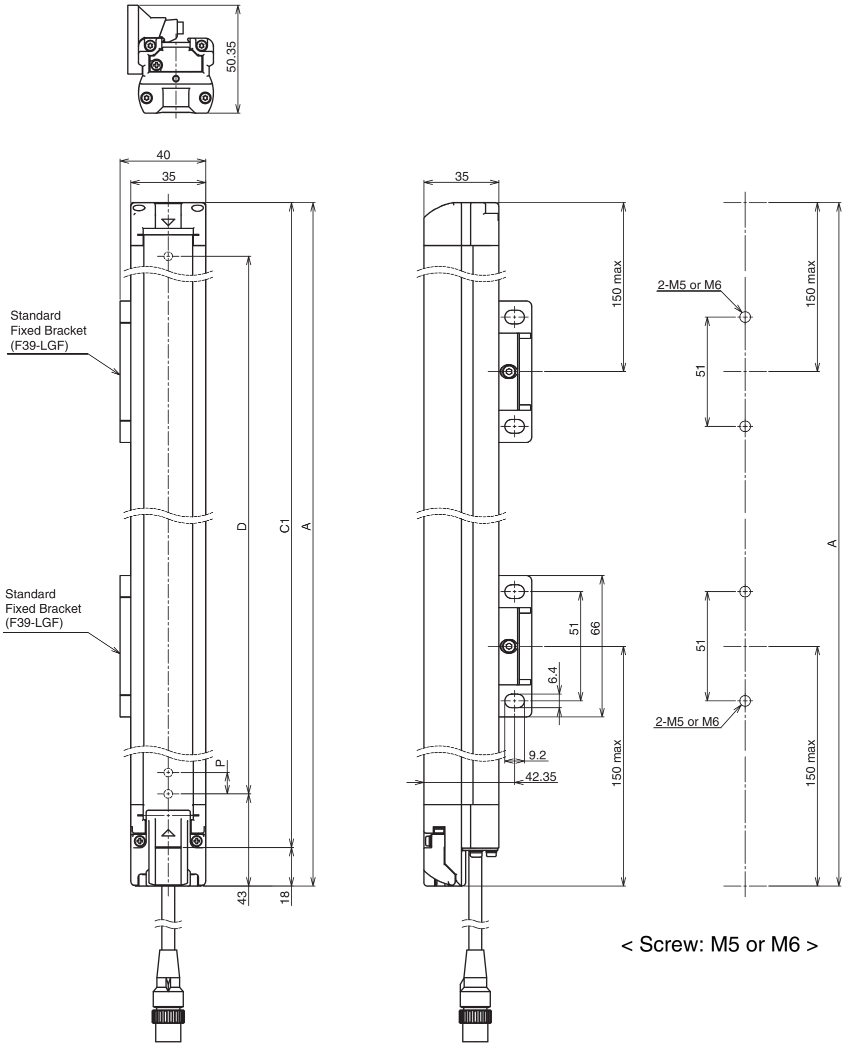
Mounted with Standard Fixed Brackets (F39-LGF)
Backside Mounting


50.35
40
35
35
Standard
Fixed Bracket
(F39-LGF)
Standard
Fixed Bracket
(F39-LGF)
150 max
150 max
150 max
150 max
2-M5 or M6
2-M5 or M6
51
51
66
51
6.4
9.2
24.85
24.85
D
C1
A
A
P
43
18
< Screw: M5 or M6 >

Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Fixed Brackets *	2	2

* The number of brackets required to mount either one of emitter and receiver.

Side Mounting

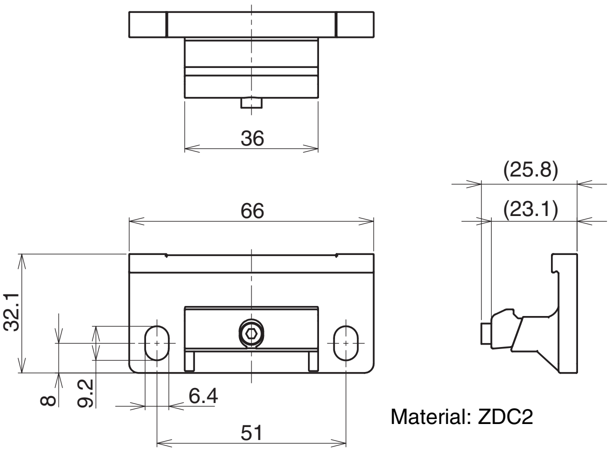

50.35
40
35
35
Standard
Fixed Bracket
(F39-LGF)
Standard
Fixed Bracket
(F39-LGF)
D
C1
A
P
43
18
150 max
2-M5 or M6
51
51
66
6.4
9.2
42.35
150 max
2-M5 or M6
150 max
51
A
150 max

< Screw: M5 or M6 >

Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Fixed Brackets *	2	2

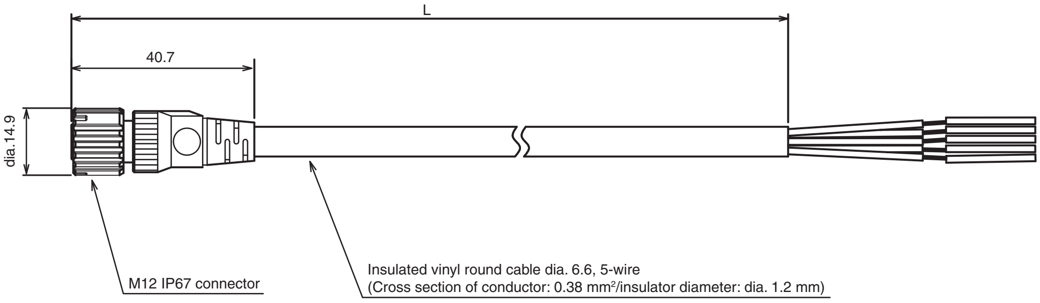
* The number of brackets required to mount either one of emitter and receiver.

Standard Fixed Bracket (F39-LGF)

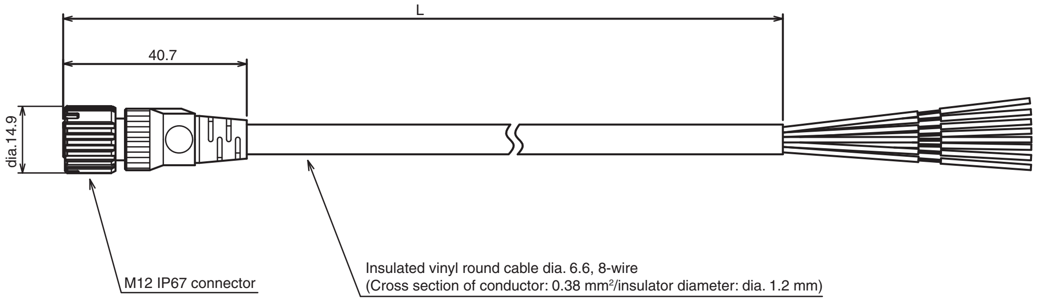

36
(25.8)
66
(23.1)
32.1
8
9.2
6.4
51
Material: ZDC2

Accessories

Single-Ended Cable for Emitter (F39-JG□A-L, sold separately)

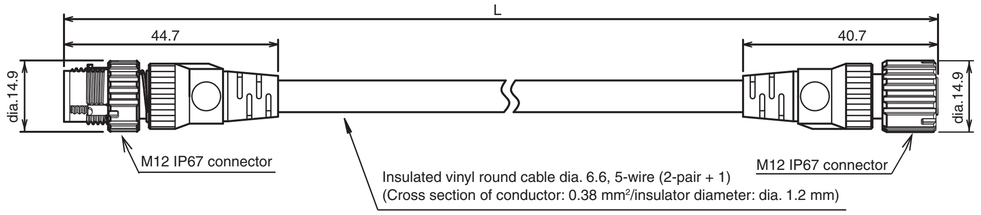

L
40.7
dia.14.9
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 5-wire
(Cross section of conductor: 0.38 mm^2/insulator diameter: dia. 1.2 mm)

Single-Ended Cable for Receiver (F39-JG□A-D, sold separately)


L
40.7
dia.14.9
M12 IP67 connector
Insulated vinyl round cable dia. 6.6, 8-wire
(Cross section of conductor: 0.38 mm^2/insulator diameter: dia. 1.2 mm)

Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JG3A-L	**F39-JG3A-D**	3
F39-JG7A-L	**F39-JG7A-D**	7
F39-JG10A-L	**F39-JG10A-D**	10
F39-JG15A-L	**F39-JG15A-D**	15
F39-JG20A-L	**F39-JG20A-D**	20

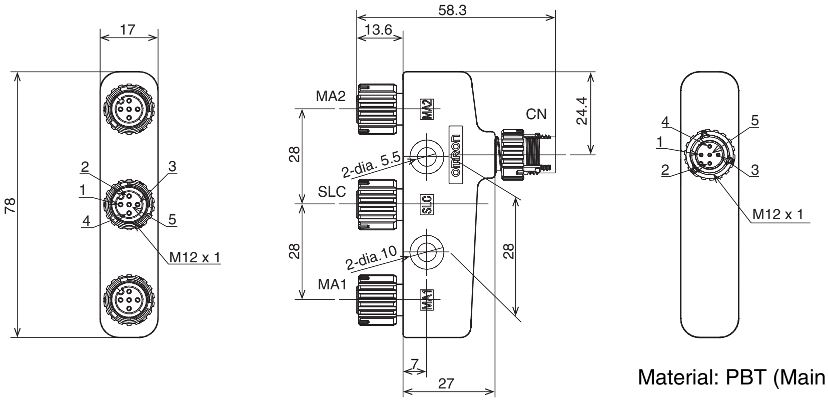
Double-ended Cable for Emitter: Cable for extension (F39-JG□B-L, sold separately)


L
44.7
40.7
dia.14.9
dia.14.9
M12 IP67 connector
M12 IP67 connector

Insulated vinyl round cable dia. 6.6, 5-wire (2-pair + 1)
(Cross section of conductor: 0.38 mm²/insulator diameter: dia. 1.2 mm)

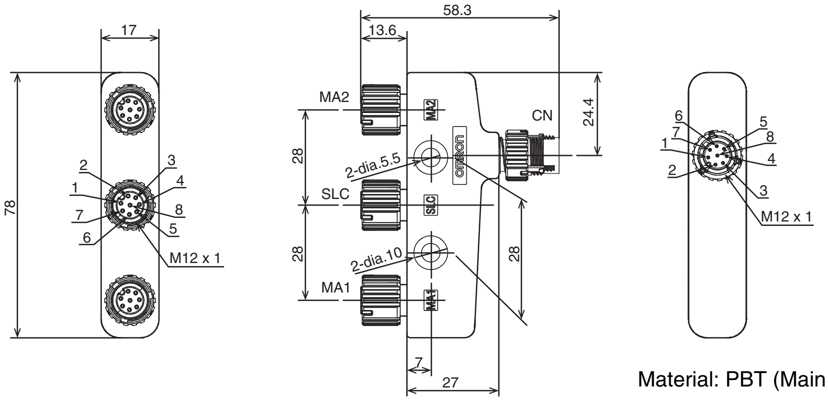
Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	**F39-JGR15B-D**	0.5
F39-JG1B-L	**F39-JG1B-D**	1
F39-JG3B-L	**F39-JG3B-D**	3
F39-JG5B-L	**F39-JG5B-D**	5
F39-JG7B-L	**F39-JG7B-D**	7
F39-JG10B-L	**F39-JG10B-D**	10
F39-JG15B-L	**F39-JG15B-D**	15
F39-JG20B-L	**F39-JG20B-D**	20

4-Joint Plug/Socket Connector for Emitter (F39-GCN4-L, sold separately)


17
78
2
3
1
4
5
M12 x 1
58.3
13.6
MA2
CN
24.4
28
2-dia. 5.5
SLC
28
2-dia.10
28
MA1
7
27
4
5
1
2
3
M12 x 1

Material: PBT (Main body)

4-Joint Plug/Socket Connector for Receiver (F39-GCN4-D, sold separately)


17
78
2
3
1
4
7
8
6
5
M12 x 1
58.3
13.6
MA2
CN
24.4
28
2-dia.5.5
SLC
28
2-dia.10
28
MA1
7
27
6
7
1
2
5
8
4
3
M12 x 1

Material: PBT (Main body)

Related Manuals

ManNo.	Model	Manual name
Z355	**F3W-MA**	Smart Muting Actuator F3W-MA Series User's Manual

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CSM_6_1_0915
Printed in Japan
Cat. No. F094-E1-04
0915(1214)